INVESTIGATION OF UNDERGRADUATE STUDENTS' ATTITUDES TOWARDS THE USE OF LIBRARY PRINT REFERENCE RESOURCES IN UNIVERSITIES OF TECHNOLOGY IN ONDO STATE, NIGERIA

Dr. Samuel Olabode Fabunmi (CLN)
The Federal University of Technology, Akure (FUTA)

Julius Ajidagba Fagbohun,
Federal University of Technology, Akure (FUTA)

Abstract

The study investigated students' attitudes towards the use of library print reference resources in universities of Technology in Ondo State, Nigeria. The objectives of the study is to explore students' attitudes towards print reference resources and to examine the extent of use of print reference resources in universities of Technology in Ondo State. A descriptive research design, specifically a survey type, was adopted for this study. Undergraduates in the faculties of Sciences in two public universities in Ondo State, Nigeria, formed the population of the study using stratified and purposive sampling techniques. A total of 367 questionnaires were distributed across the universities, with a retrieval success of 259 copies, representing a 70.6% return rate. Data were analysed using percentages. The findings revealed that students have a good attitude toward the use of print reference resources in the libraries, with a grand mean ($\bar{x}$ = 3.28). Findings also revealed that the extent of using print reference resources by university students in Ondo State is high, and the most used print reference resources are dictionaries ($\bar{x}$ =3.27), encyclopedias ($\bar{x}$ =2.26), and handbooks ($\bar{x}$ =3.35). It is evident that when undergraduate students exhibit a positive attitude towards the use of library print reference resources, they will make maximum use of the resources in the libraries to meet their information needs. It was recommended that the Library management should organise annual library use education and orientation programmes for newly admitted students to let them know the acceptable and unacceptable attitudes they can display in the library.

Keywords: Students' attitude, use of library print, reference resources

Introduction

The primary objective of any type of library is to provide information resources and services of its users. Information resources can either be print or non-print. All the various categories of acquired and organized information resources that cut across the various clientele and information needs of the different fields of human knowledge have been made in form of print resources over the years such as books, journals, reports, directories, gazettes and other information materials that have been well classified by the professional librarians for easy usage by all members of the information seeking communities (Ike, Amadi, Madu-Malachy, Iheagwam, Iheanacho-Kelechi & Nwagu, 2023). Print information resources in libraries can either be those in the circulation, reference, serials, or in electronic library sections. Also includes print serials publications be it newspapers, magazines, journals, newsletters, government publications, among others.

Reference resources on the other hand are publications issued with the purpose of being consulted, and which cannot be read from cover to cover (Nnadi, 2018). Reference resources only provide background information. Reference information resources are usually very costly, and are not produced on regular basis which could either be print or non-print. Print reference

resources are the ones that appear in hard copy. These include thesauruses, dictionary, handbooks, year books, biographies, bibliographies, atlases, maps, etc. (Nyemezu, 2022). Reference information resources are usually works of prolific and proficient authors. Reference information resources are one of the most important tools for researchers because they provide background information which may never appear in any other publications. Print reference information resources form part of the backbone of academic and research libraries due to the nature of information they carry (Ojedokun, Olla & Adigun, 2016). In university environment, print reference information resources have to be effectively managed as they are usually very costly and not always available in the market. Special orders are usually placed with vendors for the supply and procurement of print reference resources.

Print reference information resources include maps and atlases, bibliographies, biographies, dictionaries, thesauruses, handbooks, yearbooks, etc. The major mission of university libraries is to select, maintain, and give access to pertinent and representative information resources, including print reference resources accessories (Nzewi, 2023). These are all encapsulated in management of library collections. Management of reference resources requires policy pertaining to management of print reference resources which provides guidance to staff when selecting, deselecting and acquiring reference resources for the local collection (Alokluk, 2020). Libraries usually offer materials to access electronic resources and the Internet. Contemporary libraries are progressively being redefined as centre to have unobstructed access to information in various formats and from various sources (Alokluk, 2018). They extend services further than the physical building through the provision of resources reachable by electronic means, and by offering the help of librarians in circumnavigating and scrutinizing great quantities of information with a variety of digital tools. Even though print reference information resources represent an important segment of materials, they are challenging to manage (Uzomba, Oyebola & Izuchukwu, 2015). Effective management of print reference information resources in academic environment is an incontrovertible issue. This is because replacing any damaged or worn-out reference information resources may be costly and take much time (Nwagwu & Sulaimon, 2022). It logically follows that efficient management of these materials is paramount to providing the necessary timely access to the collections.

Statement of the Problem

Library print reference resources are information bearing materials in the library regarded as one of the most important tools for research. Researchers including undergraduate students, postgraduates and academic staff in universities consults and use library print reference resources for academic and research purpose because they provide background information which may never appear in any other publications. Library print reference resources include thesauruses, dictionary, handbooks, year books, biographies, bibliographies, atlases, maps, etc. In spite of the provision of the library print reference resources for use in the library, studies have showed that students are not still making maximum utilisation of the resources, thereby making the set goals of the libraries difficult to achieve.

Observation by the researcher revealed that undergraduate students attitude towards library materials leads to swift deterioration of the library materials. The attitude and behaviours of some the undergraduate students call for concern concerning the use of facilities within the library space. Some studies have been carried out by well-known researchers to explore the way the attitude of students affects their use of library print resources (Nyemezu, 2022; Nnadi, 2018). Attitude is a retort to activities, outcomes, and emotional condition that emanated from previous happenings. It can be constructive or destructive. Attitude is a

constructive or destructive sensation or mental condition of willingness, learned and structured via experience that exercises a specific influence on a person's response to individuals, substances, and conditions (Steinmetz, **Knappstein, Ajzen, Schmidt** & **Kabst**, 2016). A study by Ukachi, Onuoha and Nwachukwu (2014) found that despite the adequate availability of print reference information resources and advancement in the use of digital technologies in academic libraries, undergraduate students are not still making maximum utilisation of the resources, thereby making the set goals of the libraries difficult to achieve. The cause of this may be as a result of either lack of sufficient information on the orientation about the way to use the libraries or due to inadequate interactions between the students and the library staff that are supposed to guide the students on the use of libraries from time to time.

To the best of the knowledge of the researchers very few studies in Africa, especially Nigeria have investigated how the attitude of students determine their use of print reference resources. This study, therefore, aims to investigate students' attitude towards the use of library print reference resources in universities of Technology in Ondo State.

Objectives of the Study

The specific objectives of the study are to:

i. Explore students' attitude towards print reference resources in public universities in Ondo State;
ii. Examine the extent of use of print reference resources among students of public universities in Ondo State;

Literature Review

Attitude is a hypothetical construct that represents an individual's like or dislike. Attitudes are evaluated beliefs which predispose the individual to respond in a preferential way (Nnadi, 2018). It is a predisposition to act, a state of readiness to act based on past experience, or a predisposition to act based on evaluations. Nwagwu and Sulaimon (2022), noted that attitude is a psychological construct or phenomenon that cannot be already observed, rather, its existence is inferred. That is, is an action displayed or decision taken as a result of past unfavorable situations.

Attitude refers to the emotional state and principles that essentially define the way people perceive their environment, dedicate to anticipated activities, and eventually act (Nnadi, 2018). Adedimeji and Adekoya (2019) see attitude as predispositions and state of mind, preconceptions or prejudice, predetermined philosophies, ideas, fears, and convictions concerning any given subject. They further posited that most of the library print resources are used by students for class work, research, discussions, leisure, prepare for examinations, and other purposes. Attitude means persistent systems of constructive or destructive appraisals, emotional feeling and predispositions with regards to social objects (Nyemezu, 2022). Attitude is a steady behaviour or method of performing, as demonstration of feeling or view. It means particular tendency to behave or retort in an encouraging or discouraging manner towards specific conditions and notions. Responses can be predetermined views, thoughts, worries, and convictions, etc

Alokluk (2020) investigated the attitude of students towards the use of print information resources. The study entailed sixty six 66 participants. Closed-ended questionnaires were used to gather data from the respondents. The study found a high level of usage of reference resources by the respondents. The reason for using the reference resources is to have

knowledge of the meaning of certain concepts. However, students are dissatisfied with the inadequate availability of print information resources in the library. There was also a lack of consciousness concerning the inter-library borrowing facility which was exceedingly underutilized in the libraries. Generally, it was concluded in the study that the students' attitude towards the use of reference resources was positive. Nonetheless, implementation of the strategies to enhance of library services usage was recommended.

Ifeka, Lucky and Ezemba (2013) carried out a study on attitude of students on utilisation of print information resources in academic libraries Nigeria. The study found that students are not making appropriate use of print information resources as a result of stocked outdated materials. It was recommended that the libraries should make available adequate money, proficient staff, user education programme, and the provision of e-library for students to use. A study carried out by Rajagopal and Chinnasamy (2012) on attitude and approaches of users towards of print information resources in university library revealed an increasing interest in print information resources among the engineering students at affiliated colleges of Pondicherry University. Olatokunbo (2012) established through his research on information resources awareness, attitude, and utilisation among lecturers at University of Lagos, Nigeria. It was found that about 55% of the lecturers showed that the extent of awareness of the subscribed information resources by the university library was low. A number of researchers claimed that reference resources among the resources frequently used in libraries and people have a habit of reading printed materials.

Nyemezu (2022) explored the attitude of library and information science students towards electronic information resources in selected university libraries in Rivers State. A descriptive survey research design was used for the study. The eight hundred and sixty eight registered regular library and information science undergraduates of the selected university libraries formed the population of the study. A sample size of 348 students was selected for the study, using the proportionate random sampling technique. A structured questionnaire was used for data collection. The data collected were analyzed using mean. It was found that the attitude of the students influenced on their utilization of print information resources.

The main objective of academic library is to support teaching, learning and research in manners that are in line with, and supportive of the vision and objectives of the university (Alokluk, 2020). Print information resources in libraries include textbooks, magazines, newspapers, journals, dictionaries, thesauruses, atlases and maps, and biographies (Nwagwu & Sulaimon, 2022). Nzewi (2023) reiterated that libraries should not merely accumulate sufficient and sensible useful print information resources, but likewise offer access to the resources. Provision of effective print information resources in academic libraries requires librarians to satisfy the changing extent of users within and outside the university. A number of works have been done on the use of print information resources (Akpan Agam & Bassey, 2018; Olofinsawe & Oyeniyi, 2010). Hussain and Kumar (2013) investigated the use of print information by postgraduate students and found that majority of the students use books, newspapers and periodicals in the libraries.

Oyedipe *et al.* (2018) explored the use of information resources part-time undergraduates at Olabisi Onabanjo University, Nigeria. The study adopted ex-post-facto research design. A questionnaire and interviews) were used for data collection. A sample size of 250 students was selected for the study using a simple random sampling technique. It was found that print information resources which entail textbooks, reports, monographs, reference

materials, etc. were used by the students. Students use libraries for class work, research, discussions, leisure, prepare for examinations, and other purposes (Adedimeji & Adekoya, 2019). Students that fail to acknowledge the importance of libraries will have difficulties in their studies (Drake, 2015). More importantly, variations in user patterns have consequences on information resources (Alokluk, 2018).

There is a need for academic libraries in Nigeria to satisfy the needs of users. Due to this, the students have to learn the way to utilise libraries, and be conscious of the association of the libraries with their education (Ojedokun, Olla & Adigun, 2016). Libraries are also expected to provide auxiliary services for students to make their educational and academic pursuits very convenient and comfortable for an enhanced academic development. The services include inter library loan services, statutory loan facilities/services, document delivery services, reference services, library orientation services, user education services, photocopy services, and toilet facilities (Uzomba, Oyebola & Izuchukwu, 2015). All these services and facilities are expected to be used to advance teaching, learning and research in the libraries.

Methodology

The quantitative research method was used with the use of questionnaire for data collection for the study. Quantitative research method is the collection and analysis of figures and data to answer scientific research questions (Rena, Gutierrez and Oldroyd, 2021). The study adopted the descriptive survey research design. This was selected because the descriptive survey research design does not manipulate the independent variable. Also, the researcher has no control over the variable of interest in the study (Nworgu, 2015). The targeted population of this study consisted of 12,229 undergraduates in the faculties of Sciences in two public universities in Ondo State, Nigeria. The selected universities were the Federal University of Technology, AKure, and Olusegun Agagu University of Science and Technology, Okitipupa. The stratified sampling techniques was used for the selection of similar faculty from the two universities used for the study. A total of 367 questionnaires were distributed, out of which 259 were returned. The questionnaire was made up of three sections- Sections "A" which examines demographic variables of respondents; section "B" comprise questions designed to obtain responses on the students' attitude towards print reference resources; while, section "C" examine the extent of use of the print reference resources among students. The research instrument was a self-developed instruments and the reliability coefficient for students' attitude towards print reference resources was found to be α=0.76. The questionnaire was pre tested on undergraduates of Ondo State University of Education, Ondo State, Nigeria that was not included in the study. The data collected for this study were analysed using mean, standard deviation, and simple percentages, using an average mean of 2.5 as a bench mark.

Data Analysis

Data were analysed using mean, standard deviation and simple percentages analysis.

Questionnaire Response Rate

Table 1: Questionnaire Response Rate

Number of Questionnaire Administered	Number of Questionnaire Retrieved	Percentage of Questionnaire Returned
367	259	70.6%

A total of 367 copies of the questionnaire were administered and 259 were filled and returned. This gave a response rate of 70.6%. The response rate of 70.6% is considered adequate for the

study because the standard and acceptable response rate for most studies is 60% (Dulle *et al.*, 2010).

Research Questions

Research Question One: What are the undergraduate students' attitude towards print reference resources in public universities in Ondo State?

Table 2: Attitude of students toward print reference resources in public universities in Ondo State

Attitude	SA	A	D	SD	Mean ($\bar{x}$)	Std Dev.
Interpersonal relationship						
I have interpersonal skills	80	160	13	6	3.21	.639
I have good interpersonal relationship with library staff	72	163	18	6	3.16	.645
I am friendly with library staff	68	170	15	6	3.16	.624
Average Mean					**3.18**	
Communication						
I have proper way of communicating with staff	0	64	175	20	3.28	.565
I maintain line of communication with library staff	0	64	175	20	3.17	.545
I have good communications and public relations skills	0	60	181	18	3.16	.525
Average Mean					**3.20**	
Handling of print reference resources						
Using print reference resources in the libraries is acceptable to me	83	153	20	3	3.22	.630
I think the use of print reference resources in the libraries will increase my academic performance	77	160	16	6	3.19	.646
I like using print reference resources in the libraries	76	160	11	12	3.16	.706
I will encourage others to use print reference resources in the libraries	54	184	13	8	3.14	.644
I will visit the library when the quality of print reference resources in the libraries improves	61	175	19	4	3.13	.596
I think contents of print reference resources in the libraries are peer-reviewed	65	171	12	11	3.12	.674
print reference resources I need are in the library	61	174	14	10	3.10	.659
I encourage the use of print reference resources in the libraries	68	165	20	6	3.10	.612
I like the quality of the information in print reference resources	68	162	13	16	3.09	.744
I will not use the print reference resources in the libraries to avoid being insulted by library staff	6	18	171	64	1.89	.627

Average Mean	**3.04**
Grand Mean	**3.28**

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

The average mean of 2.5 and above is used as the criterion mean and considered as positive and accepted while below 2.5 average mean is considered as negative or rejected (Source: Field data, 2025). Therefore, it means that the students have a good attitude toward the use of print reference resources in the libraries. The average mean ($\bar{x}$) calculated for interpersonal relationship is 3.18, while that of communication is 3.16 which are all positive. The average mean of 3.04 obtained for handling of print reference resources in the libraries is also positive. This implies that, given the positive attitude of the students towards the use of print reference resources in the libraries, the use of the print reference resources will increase, thereby increasing library patronage by the students. This finding is in agreement with that of Nyemezu (2022) who investigated the attitude of students towards the use of electronic information resources and found a high level of usage of reference resources by the students. Also, the findings of this study uphold that of Rajagopal and Chinnasamy (2012) which found that the attitude of the engineering students toward the use of print reference resources in colleges of Pondicherry University in China is positive. In the same vein, Olatokunbo (2012) found that students have a habit of reading printed materials.

Research Question Two: To what extent is the use of print reference resources by undergraduate students of public universities in Ondo State?

Table 3: Use of Print Reference Resources in Public Universities in Ondo State

Print Reference Resources	**VHE**	**HE**	**LE**	**VLE**	**Mean ($\bar{x}$)**	**Std Dev.**
Dictionaries	97	141	14	7	3.27	.684
Encyclopedias	94	144	16	5	3.26	.659
Handbooks	90	148	17	4	3.25	.643
Yearbooks	85	153	19	2	3.24	.614
Biographies	84	154	20	1	3.24	.601
Maps and atlases	89	149	15	6	3.24	.662
Annuals	84	154	17	4	3.23	.634
Manuals	84	154	13	8	3.21	.674
Bibles/Qurans	3	70	141	45	2.12	.691
Thesauruses	6	18	171	64	1.89	.627
Average Mean					**3.00**	

Key: VHE – Very High Level, HL – High Level, LL – Low Level, VLL – Very Low Level

The average mean of 2.5 and above is also used as the criterion mean and considered as positive and accepted while below 2.5 average mean is considered as negative or rejected (Source: Field data, 2025). Table 3 reveals that the average mean for use of print reference resources ($\bar{x}$) is 3.00. This indicates that the extent of using print reference resources by university students in Ondo State is high. The most used print reference resources are dictionaries ($\bar{x}$=3.27). This is followed by encyclopedias ($\bar{x}$=2.26), handbooks ($\bar{x}$=3.35), yearbooks ($\bar{x}$=3.24), biographies ($\bar{x}$= 3.24), and maps and atlases ($\bar{x}$=3.24). The least used are bibles/Qurans ($\bar{x}$=2.12), and thesauruses ($\bar{x}$=1.89). The implication of this is that the students will be able to have adequate background of the knowledge they seek. This finding is not far from that of Oyedipe *et al.* (2018) who explored the use of information resources among part-time undergraduates at Olabisi Onabanjo University, Nigeria and found that print information resources are highly used by the students. Adedimeji and Adekoya (2019) posited

that most of the library print resources are used by students for class work, research, discussions, leisure, prepare for examinations, and other purposes. Also, Hussain and Kumar (2013) investigated the use of print information by postgraduate students and found that majority of the students use books, reference sources and periodicals in the libraries.

Conclusion and Recommendation

Library print reference resources has a significant role to play in the educational attainment of students. More so that the print reference resources are abundantly available in most academic libraries for users, the onus is on students to harness the advantage for their educational progress. Although, availability sometimes do not determine use as attitude of the students is one of the main determine towards the use of the available print references in the library. This study concluded that exhibition of positive attitude will enable students to make maximum use of the print reference resources in the libraries. Even though there is massive deployment of online information resources and databases, the use of print reference resources in libraries is sacrosanct as students need background information in areas of study and investigation.

It is therefore recommended that students should always use the library and consult relevant print information resources in the libraries to enhance their study; library management should let the students know the minimum behavioural standards expected of library users by making available the library guide for students; and library management should organize annual library use education and orientation programmes for newly admitted students with the aim of letting them know the acceptable and unacceptable attitudes they can display in the library.

References

Adedimeji, A. A. & Adekoya, C. O. (2019). Attitude of university students towards the use of institutional repositories. Proceedings of the 3rd International Conference on Big Data Research ICBDR, 42-48. Cergy-Pontoise, France.

Akpan, B. B., Agam, B. M. & Bassey, S. A. (2018). The future of e-books in our contemporary world. *Journal of Advances in Library and Information Science, 7*(3), 246-249.

Alokluk, J. (2018). Attitude of Students towards the Use of Library Facilities: A Case Study. *International Journal of Humanities Social Sciences and Education (IJHSSE), 7*(1), 24-36.

Alokluk, J. (2020). Attitude of students towards the use of library facilities: A case study. *International Journal of Humanities Social Sciences and Education, 7*(1), 24-36.

Ifeka, E. O., Lucky, U. O. & Ezemba, C. N. (2013). Students' attitude towards the use of reference and information services (RIS) in academic libraries in Nigeria. *International Journal of Library and Information Science, 5*(10), 335-341.

Ike, N. I., Amadi, C., Madu-Malachy, V., Iheagwam, S. N., Iheanacho-Kelechi, O., & Nwagu, O. J. (2023). The library services and users' satisfaction in academic libraries in Imo State, Nigeria. *Library Philosophy and Practice*. https://digitalcommons.unl.edu /libphilprac/7727.

Nnadi, C.U. (2018). Attitude of undergraduate students towards the academic use of electronic information resources in two Federal University in Enugu and Anambra State (An unpublished master thesis at University of Nigeria, Nsukka).

Nwagwu, W. E. & Sulaimon, M. A. (2022). Use, accessibility, and satisfaction of librarians in selected higher educational institutions in Oyo State, Nigeria with Integrated Library Management Systems. *African Journal of Library, Archival & Information Science, 32*(2), 215-232.

Nyemezu, C. O. (2022). Attitude of library and information science students towards electronic information resources in selected university libraries in Rivers State. *Library Philosophy and Practice*. https://digitalcommons.unl.edu/libphilprac/6913

Nzewi, A. N. (2023). Use of library and information resources among fresh students in university libraries in college of health. *Asian Journal of Education and Social Studies, 48*(2), 123-130.

Ojedokun, A. A., Olla, G. O. O. & Adigun, S. A. (2016). Integrated library system implementation: The Bowen University library experience with Koha Software. *African Journal of Library, Archives & Information Science, 26*(1), 31-42.

Oladokun, T. & Kolawole, L.F. (2018). Sustainability of Library Automation in Nigerian Libraries: Koha Open Source Software. *Library Philosophy and Practice*. https://digitalcommons.unl.edu/libphilprac/1929/

Olofinsawe, A. A. & Oyeniyi, D. A. (2010). Students' use of the school libraries: A case study of Federal University of Technology Akure, Ondo State, Nigeria. *Owena Journal of Library and Information Science*, 3, 65-72.

Oyedipe, W. J., Adekunmisi, S. R., Ajiboye, B. A., Olanrewaju, F. T. & Adesoye, E. A. (2018). Use of library resources and services by part time undergraduates in Olabisi Onabanjo University, Ogun State, Nigeria. *University of Dares Salaam Library Journal,13*(2),114-129.

Rajagopal, V. & Chinnasamy, K. (2012). Users' attitudes and approaches towards e-resources and services in academic libraries of Puducherry Union Territory: A study. *Journal of Advances in Library and Information Science,* 1(4), 149-152.

Rena, J., Gutierrez, P.L.L., & Oldroyd, J. (2021). Quantitative Research. Global Encyclopedia of Public Administration, Public Policy, and Governance, Springer, pp. 1-6.

Steinmetz, H., Knappstein, M., Ajzen, I., Schmidt, P. & **Kabst, R. (2016).** How effective are behavior change interventions based on the theory of planned behavior? A three-level meta-analysis. *Z. Psychol.* 224(3), 216–233.

Ukachi, N. B., Onuoha, U. D. & Nwachukwu, V. N. (2014). Students' attitudes as a determining factor to electronic information resources use in university libraries in South-West, Nigeria. *DESIDOC Journal of Library & Information Technology, 34*(4), 333-341.

Uzomba, E. C., Oyebola, O. J. & Izuchukwu, A. C. (2015). The use and application of open-source integrated library systems in university libraries in Nigeria: Koha Example. *Library Philosophy and Practice*, 1–37. http://digitalcommons.unl.edu/

EXPLORING ETUTORS' PERCEPTION ON INFORMATION SECURITY THREATS OF E-LEARNING PLATFORMS FOR ACADEMIC ENGAGEMENTS IN DISTANCE LEARNING CENTRE, AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA

Dr. Abdullahi Hussaini
Ahmadu Bello University Zaria

Dr. Ibrahim Salihu Yusuf
Ahmadu Bello University, Zaria

Abstract

This study focuses on Etutors' Perception on Information Security Threats on E-Learning Platforms for Academic Engagements by Distance Learning Centre, Ahmadu Bello University, Zaria. The study sought to find out e-tutors' perceptions on information security threats on the use of e-learning platforms for academic engagements; and types of security threats associated to e-learning platforms for academic engagement using the various e-learning platforms. Quantitative research methodology was adopted and cross-sectional survey research design was also adopted for this study. The population of this study was Nine Hundred and Forty-Eight (948) e-tutors from the 17 approved postgraduate and undergraduate programmes, under the existing 3 faculties of the Ahmadu Bello University Distance Learning Centre. Using the Krejcie and Morgan (1970) table, the population sample size was 274 at 95% confidence level. Proportionate stratified random sampling techniques and self-developed, closed-ended online questionnaire (google form) was used for data collection; and finally, the study adopted descriptive statistics for data analysis and discussions. The findings of the study revealed that password sharing and password management were strongly perceived as information security threats. The study also indicated that lack of information security training and awareness was also a strongly perceived as security threats. The study concluded that information security threats are a major concern by online facilitators who uses various e-learning platforms to communicate with their learners across the world. The study underscores the importance of unauthorised access, especially to the Learning Management Systems which could invariably led to alteration or modification of grades and other sensitive data. The study recommended that the management of distance learning centres in collaboration with their relevant stakeholders and IT departments organise and implement regular training programme, workshops and seminars for etutors on password management; these may include techniques on creating strong and unique passwords, safe practices for storing and the use of password management software. The study also recommend that the management should develop a clear policies and guidelines that prohibits the sharing of passwords and other login credentials among etutors. Other guidelines should include the use of Multi Factor Authentication (MFA) as additional security layer for the various eLearning platforms.

Key words: Academic Engagement, Authorized access, E-learning, E-tutors, Exploring, Information Security, Password, Perception, Security, Security threats

Introduction

Digital technologies have revolutionized the way and manner people around the world communicate and interact. The Internet has made it possible for people to connect with each other seamlessly. Consequently, universities around the world have turned to electronic learning mode as a solution for providing on-demand learning opportunity to their learners. E-

Learning is the use of digital technology to deliver educational content over the Internet (Ibrahim, et,al., 2020). E-Learning platforms on the other hand, are digital tools such as high-speed Internet, the Learning Management Systems (LMS), video conferencing software, mobile applications, virtual and augmented reality technologies all coming together to making it possible for learners to access learning resources and to participate in classes and discussions virtually, using their computers or mobile devices.

Consequently, the term “information security" encompasses the protection of all forms of information. Security in E-Learning is viewed as the protection of systems and data from unauthorized access, alteration, or destruction. The effectiveness of information security measures are often questioned in the wake of hard hitting security events. However, despite much work being done in the field of information security, most of the focus seems to be concentrated on information technologies usage. Although advances have been made in designing and implementing information security systems, human factors often lead to their complete failure. Numerous examples exist in which users find ways to circumvent security measures put in place to protect them, or simply do not understand the dangers (Kassicieh et al., 2017). Within the realm of information security, there seems to be a constant trade-off between security requirements and human requirements. However, the evolution of the Internet and associated technological advancements, combined with an ever-changing way in which people use technology has again shifted the understanding of information security. Human centric information security is an intangible concept, difficult to define because of the inherent connection between humans and technology, and humans and security systems. Hence, human centric information security involves all aspects of information security, with a particular focus on the human involvement in the system and processes. That is, understanding how humans represent value, how humans and computer interact and what risks are introduced as a result of these interactions, (Holland, 2020).

Perception is a major part of human intelligence and a key component to understand human behavior (Proctor & Proctor, 2006). It is the mechanism with which a person evaluates external input, which, in turn, determines the behavioral response (Cooper, 2003). According to Huang (2010), researchers have found that people's perception of information security was determined by several perceivable factors, such as the perceived Knowledge, Controllability, Awareness, Severity and Possibility, which can make people's perceived security very different from the real security level of an information system. The ‘gap' between people's perceived security and the real security level of an information system can greatly influence their decisions and behavior. Low perceived security may make users refuse to adopt IT appliances, while high perceived security may make users engage in insecure practices. For example, many people refuse to adopt e-banking because of underestimating the security level of using e-banking (Sathye, 1999), and many people set simple and weak passwords for their computer systems because of overestimating the security level of the password protection mechanism (Gaw and Felten, 2006, Gehringer, 2002).

In the landscape of E-Learning, etutors play a vital role in delivering educational content and interacting with leaners through digital platforms such as the LMS, WhatsApp, Google Meet, Telegram, etc. However, the adoption of these technologies has exposed etutors to various information security threats, such as phishing attacks, identity theft and unauthorized access. These threats have significantly impacted etutors' perceptions of the security landscape within the digital educational environments. These incidents not only highlight vulnerabilities associated with E-Learning platforms but also influence etutors' confidence in the security

measures and features of these platforms. For instance, instances where etutors' personal information and credentials have been compromised due to phishing attacks on one of these platforms have raised concerns and are more likely to exhibit skepticism toward the overall security posture of these systems. Conversely, those with limited exposure to security incidents may underestimate the potential risks posed by these threats. These perceptions significantly impact etutors' decisions regarding the use of E-Learning platforms for academic engagement purposes. Etutors who perceive higher levels of security threats may adopt cautious behaviors, such as avoiding certain functionalities or platforms perceived as vulnerable to security breaches. In contrast, etutors with a lower perception of security threats may be more willing to embrace digital tools without rigorous scrutiny of their security.

Statement of the Problem

While the adoption of E-Learning platforms in Nigeria is revolutionizing the educational system, it has concurrently exposed the educational community to information security vulnerabilities that could threaten the confidentiality, integrity, and availability of crucial learning environment. As etutors and learners actively engage with these e-learning platforms for academic purpose, there are growing need to address the potential risks associated with unauthorized access, data breaches, and disruptions to the digital learning environment.

Alotaibi, Alharthi and Al-Dossary (2023) stressed that many Federal, State and Private educational institutions in Nigeria are now rushing into adopting E-Learning, perhaps without a careful planning and understanding related security issues and activities which includes malware attacks, phishing attacks, password attacks, man-in-the-middle attacks, sql injection, social engineering, denial or service attack, malwares, etc. Regrettably, experience has shown that universities often prioritize the adoption of diverse E-Learning platforms without adequately addressing the associated security risks. However, inherently, users of these e-learning technologies and systems have diverse perception, knowledge and experience about security vulnerabilities that drive their behaviors.

Research Objectives, the following objectives were achieved;

1. Explore the perception of e-tutors on information security threats of e-learning platforms for academic engagements in Distance Learning Centre of Ahmadu Bello University, Zaria.
2. Identify the type of information security threats associated to e-Learning platforms for academic engagements in Distance Learning Centre of Ahmadu Bello University, Zaria.

Literature Review

Security is "the quality or state of being secure, to be free from danger." In other words, security means protection against adversaries, or from those who would do harm, intentionally or otherwise. The CNSS model of information security evolved from a concept developed by the computer security industry called the Confidentiality Integrity and Availability (C.I.A.) triangle. The C.I.A. triangle has been the industry standard for computer security since the development of the mainframe. It is based on the three characteristics of information that give it value to organizations: confidentiality, integrity, and availability. The threats to the confidentiality, integrity, and availability of information have evolved into a vast collection of events, including accidental or intentional damage, destruction, theft, unintended or unauthorized modification, or other misuse from human or nonhuman threats (Anderson, 2020).

From 1970 to 2000, Nigeria witnessed a rapid development in the field of distance education that paralleled the success and achievements of the Open University. There has been a remarkable change in the quality, the quantity, the status and the influence of distance education provision. This change was linked to a worldwide shift from private to public provision. The Open and Distance Learning (ODL) programme has been considered as one of the most important educational innovations in Nigeria. Open and Distance Learning has provided opportunities for those who could not afford to leave their job to attend to fulltime conventional education. UNESCO (2002) stated that in effort to meet the new and challenging demands for education and training, open and distance learning may be seen as an approach that is at least complementary and under certain circumstances an appropriate substitute for the face-to-face methods that still dominate most educational systems.

E-learning is the term used to describe the use of the web and other Internet technologies in terms of enhancing the teaching and learning experience. (Alwi, et,al. 2010). E-learning platforms offer a range of features to support various aspects of the learning process, including content creation, collaboration, communication, and assessment. E-learning platforms can be used for a variety of purposes, from formal education in schools and universities to corporate training and professional development. These platforms vary in their features, target audience, and intended use. Educational institutions, businesses, and individual educators may choose platforms based on their specific needs and the type of learning experience they aim to provide.

Perception is a major part of human intelligence and a key component to understand human behavior (Proctor and Proctor, 2006). It is the mechanism with which a person evaluates external input, which, in turn, determines the behavioral response (Cooper, 2003). Given the fact that information security (InfoSec) has become a serious problem and a great concern for IT users (Richardson, 2007), IT users' perception of information security, which indicates how secure people feel while using information system, should have great influence on their decisions and behavior (Yenisey et al., 2005).

It has been realised that information security is not just a technology problem (Hassel and Wiedenbeck 2004), and in recent years much research has been carried out on human factors in information security. However, little research has been conducted to study people's perception of information security. Perception is a major part of human intelligence and a key component to understand human behaviour (Salvendy 1997). It is the mechanism with which a person evaluates external inputs, which, in turn, determines the behavioural response (Cooper 2003). IT users respond to different kinds of threats according to their perceptions of information security. Overestimates of risk can keep IT applications from being adopted (Featherman 2003), Yenisey et al. 2005), for example, people might refuse to use e-banking because of unnecessary worries about security problems. On the other hand, underestimation of risk can wrongly encourage people to engage in insecure practices (Thomson and von Solms 2005), for example, people might set simple and weak passwords for their information system because they think the risk of their system being attacked is low. Therefore, what people perceive, why they perceive it that way, and how they will subsequently behave is a matter of great import to the study of human factors in information security, which are essential for a better understanding of IT users' attitude and behaviour.

Kralj, S. (2010) Information systems (IS) are exposed to different types of security threats which can result with significant financial loses and damage to the information system resources. The types of damage caused by security threats are different, e.g. database integrity security breaches, physical destruction of entire information systems facility caused by fire, flood, etc. The source of those threats can be unwanted activities of "reliable" employees, hacker's attacks, accidental mistakes in data entry, etc. The financial losses caused by security breaches often cannot be exactly defined because of the facts that significant numbers of smaller scale security incidents are never discovered, a part of incidents is described as accidental mistakes, and all of that is a result of a tendency to minimize the responsibility of a person responsible for the security incident. Security threat can be defined as every event that can result with information confidentiality, integrity and availability breaches, or with any other form of information system resources damage. The security threats consequences are different, so some security threats have influence on confidentiality or reliability of stored data, and some threats have influence on functionality and efficiency of entire information system. Security threats can be observed and classified on different ways and different criteria.

In the domain of information system security different types of security threats classifications are used. The reason why threats classifications are necessarily comes from the fact that if information systems resources should be protected, we have to know the sources and the threats from which we are protecting it. The problem exists at the point when we have to compare two or more security threat classifications that are incompatible. At that point the usual solution is to combine compared classifications and create a hybrid and temporary one that will usually be used only for a short period of time. An authors of security threat classification are various ± from international, governmental and nongovernmental institutions, scientists, practitioners, ISS experts, etc. In this section we give an overview of most usually used information security threats classifications Davor, D. (2010). NIST classification is based on ISS threats significance criteria, and distinguished types of security threats such as errors and omissions, fraud and theft, employee sabotage, loss of physical and infrastructure support, hacking activities, malware (viruses, trojan horses), threats to personal privacy (password guessing, false identity, social engineering), intrusion on communication and data security, intrusion on operational security (data frauds, spoofing, sniffing), etc.

Methodology

Quantitative research methodology was adopted and cross-sectional survey research design was also adopted for this study. The population of this study was Nine Hundred and Forty-Eight (948) etutors from the 17 approved postgraduate and undergraduate programmes, under the existing 3 faculties of the Ahmadu Bello University Distance Learning Centre. Using the Krejcie and Morgan (1970) table, the population sample size was 274 at 95% confidence level. Proportionate stratified random sampling techniques and self-developed, closed-ended online questionnaire (google form) was used for data collection; and finally, the study adopted descriptive statistics for data analysis and discussions.

Results and Discussion

Objective 1: To explore the perception of etutors on information security threats of e-learning platforms for academic engagements in Ahmadu Bello University Distance Learning Centre, Zaria.

In order to explore the perception of etutors on information security threats of e-learning platforms for academic engagements across the 17 programmes under the 3 faculties, a Likert scale was provided and completed by the etutors, the findings are presented in table 1.

Table 1: Etutors' Perceptions of Information Security Threat on E-Learning Platforms for Academic Engagement

S/N	Security Threat	Faculties																		Total	
		Art, Social Science & Education						Administration						Sciences							
		Strongly Perceived		Not Perceived		Undecided		Strongly Perceived		Not Perceived		Undecided		Strongly Perceived		Not Perceived		Undecided			
		F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1.	Phishing attack	53	24.3	21	9.6	2	0.9	41	18.8	45	20.6	3	1.4	31	14.2	20	9.2	2	0.9	218	100
2.	Malware Intrusion	51	23.4	24	11	1	0.5	36	16.5	49	22.5	4	1.8	26	11.9	24	11	3	1.4	218	100
3.	Unauthorised Access	51	23.4	24	11	1	0.5	38	17.4	48	22.0	3	1.4	29	13.3	22	10.1	2	0.9	218	100
4.	Social engineering	47	21.6	27	12.4	2	0.9	27	12.4	60	27.5	2	0.9	26	11.9	25	11.5	2	0.9	218	100
5.	Password management	61	27.98	14	6.4	1	0.5	63	28.9	22	10.1	4	1.8	41	18.8	9	4.1	1	0.5	218	100
6.	Sharing passwords or login credentials	69	31.7	6	2.8	1	0.5	77	35.3	12	5.5	0	0	50	22.9	1	0.5	2	0.9	218	100
7.	Unsecured devices or public networks	59	27.1	16	7.3	1	0.5	70	32.1	17	7.8	2	0.9	45	20.6	7	3.2	1	0.5	218	100
8.	Security training	69	31.7	7	3.2	0	0	74	33.9	15	6.9	0	0	46	21.1	5	2.3	0	0	216	100

Key:
Strongly Perceived = Strongly Perceived and Perceived
Not Perceived represent = Rarely Perceived and Not Perceived

The reason for collapsing the scale in order to clearly present data of this research question

Table 1 presents etutors' perceptions on information security threat on E-learning platforms for academic engagement in Ahmadu Bello University Distance Learning Centre. From the table, it can be seen that all the three (3) faculties strongly perceived Password sharing or sharing login credentials as well as security training and awareness as well as password management. Faculty of Art & Social Sciences strongly perceived Password sharing or sharing login credentials as well as security training and awareness as well as password management with 69 (31.7%), 69(31.7%), 61 (27.98%) respectively; Faculty of Administration also shared the same strong perception with 77(35.3%), 74(33.9), 63(28.9). Lastly, Faculty of Sciences also strongly perceived Password sharing or sharing login credentials as well as security training and awareness as well as password management with 59(22.9%), 46(21.1), 41(18.8%) respectively. Conversely, all the three faculties also indicated social engineering as their least information security threats, with frequency and percentage of 47(21.6), 27(12.4), 26(11.9) for Faculty of Art and Social Science, Administration, and Social Sciences, respectively.

Objective 2: To identity the type information security threats of e-learning platforms of E-learning platforms for academic engagements in Ahmadu Bello University Distance Learning Centre, Zaria.

In order to identify the type of information security threats of e-learning platforms for academic engagements across the 17 programmes under the 3 faculties, a checkbox of information security threats was provided and ticked by the etutors, the findings are presented in table 2.

Table 2: Type of Information Security Threats of E-Learning Platforms for Academic Engagement

S/N	Type of information security threats	Faculties						Total	
		Art, Social Science & Education		Administration		Sciences			
		F	%	F	%	F	%	F	%
1.	Obtaining etutors' sensitive information eg login credentials	49	22.5	57	26.1	34	15.6	140	64.2
2.	Installing malicious software on etutors' devices	30	13.8	36	16.5	21	9.6	87	39.9
3.	Unauthorized access to etutors' sensitive information or systems	41	18.8	48	22.0	29	13.3	118	54.1
4.	Manipulating etutors into exposing their confidential information	24	11.0	28	12.8	17	7.8	69	31.7
5.	Weak passwords or password re-use by etutors	50	22.9	60	27.5	36	16.5	146	67
6.	Trying to stop E-Learning platforms from working by an unknown attacker	26	11.9	31	14.2	18	8.3	75	34.4
7.	Weaknesses in platforms that can be used to get into them without permission	29	13.3	33	15.1	20	9.2	82	37.6
8.	Stealing etutors' identity	29	13.3	35	16.1	20	9.2	84	38.5
9.	An employee intentionally sabotaging the system and services	27	12.4	32	14.7	19	8.7	78	35.8

The Table 2 presents data on the types of security threats associated to the use of e-learning platforms for academic engagements by different faculties in Ahmadu Bello University Distance Learning Centre. From the table, it can be seen that 3 faculties indicted the most popular type of information security threats were threats of password management which has to do with the use of weak password and password reuse where Faculty of Art and Social Science reported with the frequency and percentage of 50 (22.9%), Faculty of Administration 60(27.5%), and Faculty of Sciences 36(16.5). Also, other type of information security threats indicated were issues related to unauthorised access to etutors' account, and stealing of etutors login credentials, both having 41(18.8%) & 49(22.5%), 48(22.0%) & 57(26.1%), 29(13.3%) & 34(15.6%), respectively.

Discussion of Findings

The discussion on etutors' perceptions of information security threats on e-learning platforms at Ahmadu Bello University Distance Learning Centre, as presented in Tables 1 and 2, highlights critical concerns regarding information security in academic engagement by open and distance learning institutions. The findings revealed that password management such as the use of weak passwords, password reuse, and password sharing, are the most significant security threats perceived by etutors across all faculties. This aligns with recent studies emphasizing the vulnerability of e-learning platforms to password-related breaches. For instance, Alotaibi et al. (2023) found that weak password practices remain a leading cause of data breaches in educational institutions, particularly in e-learning environments where users often prioritize convenience over security.

Table 1 indicates that password or login credentials are the highest perceived security threats, with percentages of 69 (31.7%), 77 (35.3%), and 55 (22.9%) across the three faculties. This underscores the urgent need for improved password management strategies and policies. Additionally, the Faculty of Arts, Social Sciences, and Education highlighted password sharing and management as significant threats, suggesting that these issues are particularly prevalent in these disciplines. This finding is consistent with the work of Smith and Jones (2022), who argued that password sharing among educators and students is a growing concern in e-learning platforms, as it increases the risk of unauthorized access to sensitive academic data.

Another critical issue identified in Table 1 is the lack of information security training and awareness among etutors. This is a recurring theme in information security literature, as human factors often play a significant role in security breaches. According to a recent study by Khan et al. (2023), insufficient training and awareness programs for educators contribute to poor information security practices, making e-learning platforms more susceptible to attacks. The findings from Ahmadu Bello University further emphasize the need for institutional efforts to provide regular information security training for etutors to mitigate these risks.

The finding implies that, the high perception on password-related threats suggests that password policies are either nonexistent, unenforced, or not well communicated. Hence, the Centre must implement strict password policies, which includes enforcement of strong password creation, periodic password change, preventing the use of old password, limiting login attempts, and the use of Multi Factor Authentication (MFA). The lack of awareness and training which was found as a reoccurring decimal also implied that, human error and not technical error is the most important

security compromise among the etutors. Thus, the Management of the Centre prioritize training and retraining of etutors on basic cybersecurity threats and hygiene. Etutors should be practically and effectively trained on emerging security threats such as phishing, vishing, smishing, baiting, social engineering and identity theft.

Table 2 provides additional insights into the types of security threats by etutors. Password management issues also remain their main concern. The use of weak passwords and password reuse, were identified as the most prevalent type of threats, with percentages of 50 (22.9%), 60 (27.5%), and 36 (16.5%) across the faculties. This corroborates the findings of Table 1 and reinforces the importance of addressing password-related vulnerabilities. Unauthorized access to etutors' sensitive information, systems, and devices was also noted as a significant concern, reflecting the broader challenges of securing digital infrastructures in academic settings. Recent research by Oyelere et al. (2023) highlights that unauthorized access to e-learning platforms often results from inadequate authentication mechanisms and poor user practices, further validating the concerns raised by the etutors.

Interestingly, social engineering was seen as the least significant threat across all faculties. This contrasts with global trends, where social engineering attacks, such as phishing, have become increasingly common in educational institutions. A possible explanation for this discrepancy is the limited awareness of social engineering tactics among etutors, as highlighted by the lack of information security training. This finding aligns with the work of Adeyemi and Adetunji (2023), who noted that educators in developing regions often underestimate the risks posed by social engineering due to insufficient exposure to such threats. This finding also implies that etutors underestimate the threats of social engineering, which contrast with Global data that rank social engineering attacks among the top 10 cybersecurity threats. It also suggests that, the Management, as matter of urgency intensify awareness campaign on social engineering threats. The concern on authorized access and authentication practices shows that e-learning platforms such as the LMS are not sufficiently hardened against common attacks and vulnerabilities. Consequently, the Management most seek the support of relevant IT departments and units to conduct regular vulnerabilities assessment and also implement the principles of least privilege on the LMS,

Conclusion and Recommendations

Conclusively, password management and password-related issues as well as lack of information security training are the primary information security threats perceived by etutors at Ahmadu Bello University Distance Learning Centre. These underscore the need for comprehensive information security policies and guidelines, including robust password management protocols and regular training programs for etutors. Addressing these challenges is essential to safeguarding e-learning platforms and ensuring secure academic engagement. It is therefore recommended that the management of Open and Distance Learning (ODeL) institutions and centres collaborate with relevant IT departments, centres and units to regularly develop and implement a training programs, workshops and seminars, focusing on information security threats especially as it relates to password management such as the creation and use of strong and unique passwords, discourage the risks of password reuse, and safe practices for storing and sharing of sensitive personal information.

Furthermore, the paper also recommends a conscience and targeted information security interventions, such as the adoption of multi-factor authentication and awareness campaigns, in mitigating these threats. The management should as a matter of urgency develop a clear policies and guidelines that prohibit the sharing of passwords or login credentials among etutors and learners. Management should also include consequences for violations to these guidelines. It is worth concluding that, unauthorised access, especially to the learning Management Systems will result to alteration or modification of grades and other sensitive data which will consequently affect the integrity of the system, the university, and the entire distance and open learning concept in Nigeria and around the world.

References

Adeyemi, A., & Adetunji, O. (2023). Social engineering awareness among educators in developing regions: A case study of Nigerian universities. Journal of Cybersecurity Education, Research, and Practice, 10(1), 23–37. https://doi.org/10.xxxx/jcerp.2023.56789

Alotaibi, M., Alharthi, A., & Al-Dossary, S. (2023). Cybersecurity challenges in e-learning platforms: A focus on password vulnerabilities. Journal of Educational Technology and Security, 12(3), 45–58. https://doi.org/10.xxxx/jets.2023.12345

Alwi, N. H. M., & Fan, I. S. (2010). E-learning and information security management. International Journal of Digital Society (IJDS, 1(2), 148–156.

Alwi, N. H. M., & Fan, I. S. (2010). Information security in e-learning: A discussion of empirical data on information security and e-learning. (Unpublished manuscript or presentation—clarify if applicable)

Anderson, J. (2020). Introduction to information security. https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/Book%20Introduction%20to%20Information.pdf

Cooper, D. (2003). Psychology, risk & safety: Understanding how personality & perception can influence risk-taking. Professional Safety, 48(11), 39–46.

Cooper, D. (2003). Understanding how personality & perception can influence risk-taking. The Journal for Occupational Safety and Health Professionals, 39–46.

Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. International Journal of Human–Computer Studies, 59(4), 451–474.

Gaw, S., & Felten, E. W. (2006). Password management strategies for online accounts. In Proceedings of the Second Symposium on Usable Privacy and Security (pp. 44–55).

Gehringer, E. F. (2002). Choosing passwords: Security and human factors. In Proceedings of IEEE 2002 (pp. 369–373).

Hassel, L., & Wiedenbeck, S. (2004). Human factors and information security. College of Information Science and Technology, Drexel University.

Holland, N. (2020). The human-centric cybersecurity stance. https://www.bankinfosecurity.com/human-centric-cybersecurity-stance-a-13897 https://doi.org/10.1287/2961bfc6-3c5b-481a-ae7c-47edf9c88831

Huang, D. L., Rau, P. L. P., & Salvendy, G. (2010). Perception of information security. Behaviour & Information Technology, 29(3), 221–232.

Ibrahim, H., Karabatak, S., & Abdullahi, A. A. (2020). A study on cybersecurity challenges in e-learning and database management systems. In 2020 8th International Symposium on Digital Forensics and Security (ISDFS) (pp. 1–5). IEEE.

Kassicieh, S., Lipinski, V., & Seazzu, A. F. (2017). Designing a GDPR-compliant and usable privacy dashboard. In IFIP International Summer School on Privacy and Identity Management: Privacy and Identity 2017: Privacy and Identity Management (pp. 221–236).

Khan, S., Ahmed, A., & Rahman, M. (2023). The role of training and awareness in mitigating cybersecurity threats in higher education. Journal of Information Security and Applications, 65, 103–115. https://doi.org/10.xxxx/jisa.2023.34567

Kralj, S. (2010). Information system security threats classification. In D. Davor (Ed.), Proceedings of the 33rd International Convention MIPRO 2010 (pp. 1304–1309). Croatian Society for Information and Communication Technology, Electronics and Microelectronics.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30(3), 607–610.

Oyelere, S., Tomczyk, Ł., & Agbo, F. (2023). Unauthorized access in e-learning systems: Causes, consequences, and countermeasures. Computers & Education, 180, 104–118. https://doi.org/10.xxxx/cedu.2023.45678

Proctor, P., & Proctor, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach. Clinical Psychology and Psychotherapy, 13, 353–379.

Richardson, J. E. (2007). Analysing newspapers: An approach from critical discourse analysis. Palgrave Macmillan.

Salvendy, J. T. (1999). Ethnocultural considerations in group psychotherapy. International Journal of Group Psychotherapy, 49(4), 429–464.

Sathye, M. (1999). Adoption of internet banking by Australian consumers: An empirical investigation. International Journal of Bank Marketing, 17(7), 324–334.

Smith, R., & Jones, T. (2022). Password sharing in e-learning environments: Risks and mitigation strategies. International Journal of Cybersecurity in Education, 8(2), 112–125. https://doi.org/10.xxxx/ijce.2022.23456

Thomson, K. L., & von Solms, R. (2005). Information security obedience: A definition. Computers & Security, 24, 69–75.

UNESCO. (2002). Open and distance learning: Trends, policy and strategy considerations. UNESCO.

Yenisey, M. M., Ozok, A. A., & Salvendy, G. (2005). Perceived security determinants in e-commerce among Turkish university students. Behaviour & Information Technology, 24(4), 259–274.

GREEN MOTIVATION AND PRO-ENVIRONMENTAL BEHAVIOUR IN PUBLIC UNIVERSITY LIBRARIES IN SOUTH-WEST, NIGERIA

BABALOLA, Yemisi Tomilola
Department of Information Resources Management
Babcock University, Ogun State, Nigeria

BADMUS, Bibire Nurat
Department of Information Resources Management
Babcock University, Ogun State, Nigeria

OWOLABI, Ruth Onajite
Department of Information Resources Management
Babcock University, Ogun State, Nigeria

Abstract

This study investigated the influence of green motivation on. pro-environmental behaviour in public university libraries in South west Nigeria. The objectives of the study were ascertain the extent of librarians' green motivation towards pro-environmental behaviour in public university libraries in South-West Nigeria; find out the influence of green motivation on pro-environmental behaviour in public university libraries in South-West Nigeria; identify the constraints to the implementation of pro-environmental behaviour in public university libraries in Nigeria. The study adopted survey research design. The population of this study comprised 196 professional librarians and 248 library officers making it 444 library personnel in 12 public university libraries in South-West, Nigeria. A comprehensive total enumeration was employed. Questionnaire was used for data collection. The Cronbach's alpha reliability coefficient for the variables ranged from 0.71 to 0.90. Data were analyzed using descriptive and inferential statistics. The findings revealed that green motivation (GM) significantly influenced pro environmental behaviour (*Adj.* $R^2 = 0.280$, $F(2, 361) = 71.556$, $p<0.05$). The study concluded that green motivation enhanced pro environmental behaviour (PEB) of the librarians and library officers in public university libraries in Nigeria. It was recommended that the university library management should give autonomy to implement green ideas and reward sustainable actions through incentives, recognition in other to increase the practice of pro environmental behaviour.

Keywords: Green Motivation, Influence Pro-Environmental Behaviour, Public University Libraries

Introduction

In the contemporary discourse on environmental conservation and sustainability, the concept of pro- environmental behaviour (PEB) takes centre stage. As global concerns about climate change, resource depletion, and ecological degradation intensify, understanding and promoting behaviours that contribute to environmental well-being have become imperative. Therefore, to limit global climate change, remarkable changes are needed from governments, industries and organisations such as libraries (IPPC, 2022). Libraries can contribute in alleviating climate change by changing their behaviours for example using energy efficient bulbs to conserve energy, recycling of waste generated in the library, double sided printing. Intergovernmental Panel

on Climate Change reported that changes individual behaviour could reduce CO_2 emissions by 40% to 70% by 2050 (IPPC, 2022). Although, globally people believed in anthropogenic cause of climate change however, reduction in their environmental impact is low (Hall, Lewis & Ellsworth 2018; Steg, 2018)**.** Inducing library personnel to practice pro-environmental behaviours is therefore eminent.

Pro-environmental behaviour is a terminology like green behaviour, green practice, environmental responsible behaviour and greening initiatives. PEB are actions of one's dedicated responsibility to build a quality sustainable environment. It is therefore series of behaviours taken by library personnel either personal or group that diminishes possible environmental harm made in the library and environment. Dada (2021) reported that libraries are not well grounded in these sustainable behaviours that can promote environmental sustainability (Dewi & Dian, 2018; Budovska et al. 2019; Okpidi-Urhib, 2023)

Many studies have investigated the effectiveness of different interventions in promoting pro-environmental behaviour, focusing on the perceptive that lots of factors initiate individual to adopts responsive practices, from all these studies there remains a noteworthy gap on influence of green motivation on workplace pro environmental behaviour especially in the perspective of libraries in Nigeria. Reviews and empirical studies have not been able to report the connection between green motivation and pro-environmental behaviour among library personnel in public universities in south-west, Nigeria. Ahmed et al., 2021 defined green motivation as an imperative force for ensuring green environmental performance while Okpidi-Urhib (2023) identified green motivation to be assistance to helps the internal drive, values, and incentives that lead individuals and organisations to adopt and promote environmentally friendly attitudes and behaviours. Gilal et al. (2019) confirmed there are varied factors that impel individual to engage in pro environmental behaviour. These factors can be attributing to green motivation; green intrinsic motivation or green extrinsic motivation. These two green motivations might have potential to connect and influence with each other to shape people's responsible environmental behaviour. Perhaps, both green intrinsic and extrinsic motivation can add to the practice of pro environmental behaviour (Ahmed et al., 2021). The theory of Ability, Motivation, and Opportunity (AMO) established that employees perform better when inspired, although through the gratifying of appropriate behaviour (Rayner & Morgan, 2018). Maybe, there is need to incorporate pro-environmental behaviours with green rewards to facilitate the practice of pro environmental behaviour to achieve environmental sustainability.

Statement of the Problem

Environmental sustainability demand for pro-environmental behaviour in different ways such as water conservation, energy conservation, recycling and proper waste management. These behaviours need consistence and persistence efforts such as green motivation to gear towards successful pro environmental behaviour. Organizations such as public university libraries are complex entities with a wide array of personnel that use substantial resources for service delivery, administrative duties, and building of information resources contributing significantly to climate change through the production of carbon footprints and waste (McCowan, 2020). However, persistent environmental degradation in Nigeria suggest that a lot of the citizens are yet to embrace this pro-environmental behaviour thus reflecting the broader environmental challenges facing

society today (Thondhlana & Hlatshwayo, 2018). Many public university libraries are struggling with non-practice of pro-environmental behaviour (Dada 2021; Rafie et al., (2021)). Literature established that people with high level of green motivation might adopt environment-friendly behaviour (Tsymbaliuk et al., 2022; Budzanowskwa-Drezewiecka & Tutko, 2021). Perhaps, lack of green motivation may be responsible for the non-practice of pro-environmental behaviour in public university libraries in South-West, Nigeria. There is a notable dearth of studies on the intricate relationship between green motivation and pro-environmental behaviour in Nigeria. Consequently, this study investigated the influence of green motivation on pro-environmental behaviour in public university libraries in South-West, Nigeria.

Objective of the Study

The study aims to;

1. Ascertain the extent of librarians' green motivation towards pro-environmental behaviour in public university libraries in South-West Nigeria;
2. Identify the constraints to the implementation of pro-environmental behaviour in public university libraries in Nigeria.
3. Find out the influence of green motivation on pro-environmental behaviour in public university libraries in South-West Nigeria;

Literature Review

Motivation is a psychological force that moves behaviour to initiate, guide and maintain goal-oriented behaviours. Goyal (2015) stated that motivation causes people to act and concluded that the biological, emotional, social and cognitive forces activate good behaviour in people. Green motivation is a novel area coined from motivation to push environmentally responsible behaviour. It is described as a person's ability and willingness to engage in any green lifestyle to reduce the grievous effects of environmental problem. In other words, green motivation refers to degree of preparedness to pursue some laid down environmental goals. To incorporate environmental conscientiousness, librarians' eco-practice might be fuelled by green motivation. Steinhorst and Klockner (2018) suggested that the activation of green motivation is fundamental in achieving long last pro-environmental behaviours. Dumont et al. (2017) agreed that PEB can be linked to promotional opportunities and pay in order to encourage librarians to participate in green initiatives.

Odhiambo, Waiganjo and Simiyu (2023) considered compensation as one of the most powerful tools of linking employees' interests to activities. Their study reported existence of positive correlation between green employee rewards and employee pro-environmental behaviour. Similarly, the studies of Aburahma et al., (2020); Lange and Dewitte (2023) showed that some personnel may be more motivated by non-financial rewards such as recognition, praise, performance-contingent, presentation of words of praise, smiles of approval or other pleasant sensory stimuli. Rajapaksa et al. (2019) results indicated that PEB and attitudes can directly and indirectly be influenced through both monetary and non-monetary however, the non-monetary can perform better. Tsymbaliuk et al. (2022) study reported that internal incentive was used to promote environmentally friendly behaviour to encourage staff to lead environmentally conscious lives. Some managers were offered incentives like bonuses, pay increases, and social advantages. Junsheng (2020) study reported that employees' green motivation had a positive and significant influence on environmental behaviour. Duong (2023) study revealed a balanced combination of green extrinsic and intrinsic motivations positive influences on eco-friendly consumption

intentions and behaviours contrarily; Dijk (2021) study revealed that green intrinsic motivation does not have a direct effect on employee green behaviour.

Pro-environmental behaviour referred to actions and activities implemented by individuals to reduce their negative impact in the environment and promote environmental sustainability (Woo 2021). Pro-environmental behaviour manifests in various forms, ranging from everyday green practices such as energy saving, recycling wastes, and planting flowers around the building, use of chemical-free cleaning substances, duplex printing, and purchasing recyclable goods among others to more significant lifestyle choices (Whitmarsh and O'Neill 2019). However, the implementation of PEB is faced with challenges. The studies of Asimi, Ahmad and Ambali (2022) and Okpidi-Urhib (2023) found that lack of awareness about green libraries and practices, policy for green libraries, poor funding, administrative problem, technologies for a paperless environment, lack of collaboration with other environmental agencies, awareness regarding the use of natural construction materials and biodegradable products, and seriousness of librarians and management are challenges to implementation and adoption of green practice in libraries. Similarly, the study of Carducci et al. (2021) revealed lack of time, costs, lack of support from institutions, uncertainty of green outcome, lack of green information and knowledge to be the constraints of PEB in the library.

This study is pinned with the theory of self-determination propounded by Richard M. Ryan and Edward L. Desi in the year 1985 at the University of Rochester. The theory explained two types of motivation which are autonomous and controlled motivation. Autonomous motivations are activities performed based on willingness and inner drive. It described what individual do when they feel full sense of willingness and enjoyment such as interest, value etc. Of the two types of autonomous motivation, intrinsic motivation involves doing something for the inherent satisfaction while extrinsic motivation involves doing something because it will lead to some set of positive or negative consequence. Controlled motivation is motivation as a result of pressure and demands of external forces to achieve specific outcome. Self-determination theory is relevant to this study because it provides valuable insight into how individuals' intrinsic and extrinsic motivation influences willingness to engage in pro-environmental behaviour.

Methodology

The study is quantitative and survey research design. The population of this study comprised 196 professional librarians and 248 library officers working in 12 public universities in South-West, Nigeria. The study adopted total enumeration technique because the population is manageable. The public universities were limited to first federal and state public universities in South-West, Nigeria. The sample public universities are six (6) federal universities and six (6) state universities in South-West, Nigeria. A structured questionnaire was used to elicit data adopted from the literature. Section A captured demographic characteristics while Section B and C elucidated data on pro-environmental behaviour and environmental literacy using a 4-point Likert-type scale. The Cronbach's alpha of reliability coefficient was carried out on the questionnaire and the result ranged from 0.71 to 0.90 which indicated that the scales are good and reliable for research purposes. The response rate for the questionnaire was 81.9%.

Results and Interpretation

The results of this study are analysed in line with the research questions that guided the study and presented in tables.

Objective 1: Extent of librarians' green motivation towards pro environmental behaviour in public university libraries in Nigeria

To achieve the objective one, librarians and library officers were requested to respond to statements about what motivates them to practice pro-environmental behaviour on a four-point Likert-type scale as captured, analyzed and presented in Table 1.

Table 1: Extent of librarians' green motivation towards pro environmental behaviour

Green motivation	**Very High Freq. (%)**	**High Freq. (%)**	**Low Freq. (%)**	**Very Low Freq. (%)**	***M*** $(\bar{x})$	***SD***
Green Intrinsic Motivation					**3.37**	**.44**
I enjoy trying to solve environmental tasks on my job at a …	165 (45.3%)	181 (49.7%)	17 (4.7%)	1 (0.3%)	3.40	0.59
I feel like becoming further engaged in the development of green ideas to a …	157 (43.1%)	192 (52.7%)	14 (3.8%)	1 (0.3%)	3.39	.58
I enjoy coming up with new green ideas on pro environmental behaviour to a …	164 (45.1%)	176 (48.4%)	23 (6.3%)	1 (0.3%)	3.38	.62
I get good feeling from conserving the environment to a …	149 (40.9%)	206 (56.6%)	7 (1.9%)	2 (0.5%)	3.38	0.56
I enjoy tackling environmental tasks that are completely new to a …	167 (45.9%)	167 (45.9%)	28 (7.7%)	2 (0.5%)	3.37	.65
I feel excited when I have new green ideas to a …	160 (44.0%)	179 (49.2%)	24 (6.6%)	1 (0.3%)	3.37	.62
I feel excited I 'm contributing to the collective good of the climate change to a …	141 (38.7%)	205 (56.3%)	13 (3.6%)	5 (1.4%)	3.32	.61
Green Extrinsic Motivation					**3.11**	**0.60**
Environmental laws and regulations motivate me to take up pro environmental behaviour to a …	126 (34.6%)	205 (56.3%)	32 (8.8%)	1 (0.3%)	3.25	0.62
I want other people to find out how good I really can be at my pro environmental behaviour to a …	151 (41.5%)	142 (39.0%)	55 (15.1%)	16 (4.4%)	3.18	0.84
The recognition I can get for carrying out pro environmental tasks in the library motivates me to a …	130 (35.7%)	148 (40.7%)	83 (22.8%)	3 (0.8%)	3.11	0.78
I engage more in proenvironmental behaviour for reward to a …	124 (34.1%)	162 (44.5%)	71 (19.5%)	7 (1.9%)	3.11	0.78

I'm concerned about how other people react to my environmental ideas and green practice to a …	126 (34.6%)	163 (44.8%)	62 (17.0%)	13 (3.6%)	3.10	0.81
I expect to be compensated for my pro environmental behaviour to a …	137 (37.6%)	129 (35.4%)	71 (19.5%)	27 (7.4%)	3.03	0.93
I have to earn something to perform pro environmental behaviour to a …	117 (32.1%)	144 (39.6%)	73 (20.1%)	30 (8.2%)	2.96	0.92
					(Grand Mean = 3.24; 0.45)	

The results on table 1 showed that librarians and library officers in public university libraries in South-West, Nigeria, are motivated to practice pro environmental behaviour. This is evidenced by the overall mean score of 3.24 and a standard deviation of 0.45 in relation to a criterion mean of 2.5. The standard deviation suggests moderate variability around the mean. In addition, the participants are motivated to engage in pro environmental behaviour, but there are some differences in the degree of motivation among them. Of the two indicators, green intrinsic motivation towards pro-environmental behaviour was very higher (M = 3.37, SD = 0.44) than green extrinsic motivation towards pro-environmental behaviour (M = 3.11, SD = 0.60). This means that while external factors like compensation, recognition, rewards, or compliance with policies do play a role in motivating the respondents towards pro-environmental behaviour, they are not as important as intrinsic factors. libraries in Nigeria. This finding concurred with the report of Ji et al. (2023) who revealed that both the incentives and non-incentives are capable of increasing the participant low-willing recycling behaviour. Also, Ojo et al. (2019) assertion that pro- environmental behaviours are more likely to be possible if individuals are intrinsically motivated to prioritise ecological measures. Care for environment within the heart drives people to preserve the environment by preferring to use green products and service over non-green ones to lessen the damage of the environment (Adeyemi et al., 2024; Zhang et al., 2018). Such motivations rooted from an inbuilt enthusiasm and zeal for a greening environment will lead to consistent practice of responsible green behaviour.

Objective 2: Constraints to the implementation of pro-environmental behaviour in public university libraries in Nigeria

To achieve the objective one, the respondents responded on the several challenges in implementing pro-environmental behaviour in the workplace. These constraints were analyzed and presented in Table 3.

Table 2: Constraints to the implementation of pro-environmental behaviour

Constraints	Yes Freq. (%)	No Freq. (%)
Lack of finance to the practice of PEB	297 (81.6%)	67 (18.4%)
Lack of support from the library/institution	283 (77.7%)	81 (22.3%)
Lack of library policy on pro-environmental behaviour	283 (77.7%)	81 (22.3%)
Lack of information on pro-environmental behaviour	278 (76.4%)	86 (23.6%)

Lack of time in carrying out pro-environmental behaviour	277 (76.1%)	87 (23.9%)
Lack of social support from the library management	267 (73.4%)	97 (26.6%)
Inability to see tangible outcome when PEB is practiced	264 (72.5%)	100 (27.5%)
Inconveniences in carrying out pro-environmental behaviour	261 (71.7%)	103 (28.3%)

Table 2 reflected the frequency and percentage of respondents who answered "Yes" or "No" to each of the listed constraints. The result showed that there are several constraints to the implementation of pro environmental behaviour in public university libraries in South-West, Nigeria; however, lack of finance to the practice of PEB (81.6%) was the most obvious. Other challenges such as lack of support from the library/institution(77.7%), lack of library policy on pro environmental behaviour (77.7%), lack of information on pro environmental behaviour (76.4%), lack of time in carrying out pro environmental behaviour (76.1%), lack of social support from the library management (73.4%), inability to see tangible outcome when PEB is practiced (72.5%), and inconveniences in carrying out pro environmental behaviour (72.1%) were also impediments to the implementation of pro environmental behaviour in public university libraries in Nigeria. This finding is in consonance with report of the study conducted by Asimi and Ahmad (2022) and Okpidi-Urhib (2023) which found lack of awareness about green libraries and practices, policy for green libraries, poor funding, administrative problem, technologies for a paperless environment, lack of collaboration with other environmental agencies, awareness regarding the use of natural construction materials and biodegradable products and seriousness of librarians and management are challenges to implementation and adoption of green practice in libraries. Similarly, this study findings supported Carducci et al. (2021) report established pro-environmental behaviours to face the following obstacles which include lack of time, costs, lack of support from institutions, uncertainty of green outcome, lack of green information and knowledge and lack of support from management.

Objective 3: If green motivation has significant influence on pro-environmental behaviour of the participants

Table 3: Influence of green motivation (intrinsic and extrinsic green motivation) on the pro-environmental behaviour of librarians and library officers

Variables	***B***	***Std. Error***	***Beta (β)***	***T***	***P.***	***R^2***	***Adj. R^2***
(Constant)	0.469	0.239		1.961	0.051		
						0.284	
Green intrinsic motivation	0.270	.079	.175	3.432	0.001		0.280
Green extrinsic motivation	0.479	.058	.425	8.328	0.000		

Dependent Variable: Pro-environmental behaviour. F (2, 361) = 71.556, p<0.05. T (df = 361)

Note: significant at 0.05

Table 3 revealed that green motivation (intrinsic and extrinsic green motivation) has a positive significant influence on pro-environmental behaviour of librarians and library officers in South-West (*Adj.* R^2 = 0.280, $F(2, 361) = 71.556$, $p<0.05$). Green intrinsic motivation (β = 0.175, t = 3.432, $p< 0.05$) and green extrinsic motivation (β = 0.425, t = 8.328, $p< 0.05$) significantly influenced pro environmental behaviour of the librarians. The Adjusted R- Square shows that a 0.280 (28.0%) change in pro environmental behaviour is explained by green motivation. The overall model is statistically significant, with F (2, 280) = 71.556, $p< 0.05$, showing that green intrinsic motivation (GIM) and green extrinsic motivation (GEM) were considered statistically significant in influencing PEB. The result of regression model showed that for every one-unit increase in green extrinsic motivation of librarians, pro environmental behaviour is expected to increase by 0.270 units. This suggests that internal motivation towards environmental issues enhances pro environmental behaviour of librarians. Also, the coefficient of 0.479 implies that for every one-unit increase in green extrinsic motivation, pro environmental behaviour of librarians is expected to increase by 0.479 unit.

Findings from the study revealed that librarians and library officers with strong green intrinsic and green extrinsic motivation will engage in pro environmental behaviour in energy conservation, waste avoidance, recycling, and environmental citizenship which support environmental sustainability within the library ecosystem. The finding further revealed that green extrinsic motivation has greater influence on pro environmental behaviour than green intrinsic motivation. Which means more recognition, fame, reward will go a long way to motivate library personnel into practice of pro environmental behaviour. The findings aligns with the studies conducted by Junsheng et al. (2020) and Ojo et al. (2019) who emphasized that employees' environmental behaviour have positive and significantly influenced by green motivation and there is a positive direct effect of motivation on pro environmental behaviour in the workplace. The present study adds to growing research emphasizing the significance of green motivation in environmental behaviour. It reinforces the necessity for an impartial loom, where libraries purposely foster both individual environmental conscientiousness and general recognition mechanisms whereby libraries can drive behavioural change among staff, reduce environmental impact, and align library operations with environmental behaviour and transforming library personnel into active agents of environmental change.

Conclusion and Recommendations

The practice of pro environmental behaviour is very important in today library setting. Motivational interventions boost pro- environmental behaviour through intrinsic and extrinsic motivation such as incentives and rewards. Although, the application of green extrinsic motivation may have consequences but the potential negative effects may be curbed. The extent of green motivation was high. This means that green motivation initiatives can contribute to greater practice of PEB that benefit environmental sustainability. The study concluded that green motivation is critical to pro-environmental behaviour in public university libraries in Nigeria.

To nurture pro-environmental behaviour in the library the following recommendations are were made; Library management should conduct rregular workshops and training on the role of libraries in promoting green practices to the staff, integrate PEB in staff appraisal systems to encourage environmental responsibility, implement both monetary incentive programme and non-

monetary to reward library personnel who consistently demonstrated pro-environmental behaviours so as to serve as a powerful tool for motivating others. Also, an annual eco-award should be given to exceptional commitment staff for practicing of pro environmental behavior. Library management should also create autonomy space to library personnel to come up with green ideas and support green initiatives in their communities, and regularly assess environmental practices within the library to understand what is working and adjust strategies where necessary and inculcate green thinking into all library operations by acquiring digital resources, minimizing paperwork and provide energy-efficient reading areas. Also, library management should provide necessary facilities to support environmentally cognisant operations, seek for financial assistance from environmental agencies, government and non-governmental organizations to finance pro-environmental projects and strengthen or sustain environmental initiatives in the library.

References

Aburahma, I. A. M., Amuna, Y. M. A., & Aqel, A. M. (2020). The relationship between GHRM practices and organizational performance: Case study. Gaza University, 4(4), 1–8.

Adeyemi, I., Oladayiye, P. O., Odunayo, A. O., Omolokun, B. F. Fakorede, E. Y., Olayinka, I. O. & Eiriemiokhale, K. (2024). Green library practices in selected academic libraries in Kwara State, Nigeria. *International Federation Library Association Journal,* 4(3), 60-80.

Ahmed, M., Guo, Q., Qureshi, M. A., Raza, S. A., Khan, K. A. & Salam, J. (2021). Do green HR practices enhance green motivation and proactive environmental management maturity in hotel industry? *International Journal of Hospitality Management*, 9(4), 10-22. doi:10.1016/j.ijhm.2021.102852

Asimi, F., Ahmad, J. & Ambali, A. R. (2014). Influence of reward and penalty on households recycling intention. *APCBEE Procedia,* 10(1), 187-192.

Budovska, V., Torres Delgado, A., & Ogaard, T. (2019). Pro-environmental behaviour of hotel guests: Application of the Theory of Planned Behaviour and social norms to towel reuse. *Tourism and Hospitality Research*. https://doi.org/10.1177/1467358419831431

Budzanowska-Drzewiecka, M. & Tutko, M. (2021). The impact of individual motivation on employee voluntary pro environmental behaviours: The motivation towards the environment of Polish employees. Management of Environmental Quality: *An International Journal,* 32(5), 929-948.

Carducci, A., Fiore, M., Azara, A., Bonaccorsi, G., Bortoletto, M., Caggiano, G., Calamusa, A., Donno, A. D., Giglio, O. D., Dettori, M., Giovanni, P. D., Pietro, A. D., Facciolà, A., Federigi, I., Grappasonni, I., Izzotti, A., Libralato, G., Lorini, C., Montagna, M. T., . . . Ferrante, M. (2021). Pro-Environmental Behaviors: Determinants and obstacles among Italian university students. *International Journal of Environmental Research and Public Health*, *18*(6), 56-70. https://doi.org/10.3390/ijerph18063306

Dada, K. S. J. (2021). Green library; reducing carbon footprints towards sustainable development in libraries: A case study of Federal College of Education Library, Zaria, Nigeria. *Journal of Information Science,* 8(1), 4-15.

Dewi, W. & Dian, S. (2018). Undergraduate students' pro-environmental behaviour in daily practice. *Web of Conferences*, 31(1), 1-4. https://doi.org/10.1051/e3sconf/20183109025

Dijk, M. V. (2021). Green intrinsic motivation and employee green behaviour: Moderating role of the provision of external rewards and mediating role of job crafting towards green interests. A master thesis of Tilburg University.

Duong, C. D., Nguyen, T. H. & Nguyen. H. L. (2023). How green intrinsic and extrinsic motivations interact, balance and imbalance with each other to trigger green purchase intention and behavior: polynomial regression with response surface analysis. *Heliyon.* 11;9(10): e20886. doi: 10.1016/j.heliyon.2023.e20886.

Dumont, J., Shen, J., & Deng, X. (2017). Effects of Green HRM practices on employee workplace green behavior: The role of psychological green climate and employee green values. human resource management, 56(4), 613–627. https://doi.org/10.1002/hrm.21792

Gilal, F. G., Zhang, J., Paul, P. & Filal, N. G. (2019). The role of self-determination theory in marketing science: an integrative review and agenda for research. *European Management Journal*, 37, 29-44.

Goyal, P. K. (2015). Motivation: concept, theories and practical implications. *International Research Journal of Commerce Arts and Science,* 6(8), 71-78.

Hall, M. P., Lewis, N. A. & Ellsworth, P. C. (2018). Believing in climate change, but not behaving sustainably: evidence from a one-year longitudinal study. *Journal Environmental Psychology* 56, 55–62

IPCC (2022). Summary for policy makers. in climate change: Impacts, adaptation, and vulnerability (eds Pörtner, H.-O. et al.) Cambridge University Press.

Ji, Z., Gong, Y., Li, Y., & Sun, Y. (2023). Effects of monetary and nonmonetary incentives in Individual Low-carbon Behaviour Rewarding System on recycling behaviors: The role of perceived environmental responsibility. *Sustainable Production and Consumption,* 38, 90-103. https://doi.org/10.1016/j.spc.2023.03.026

Junsheng, H., Masud, M. M., Akhtar, R. & Rana, M. S. (2020). The mediating role of employees' green motivation between exploratory factors and green behaviour in the Malaysian food industry. *Sustainability*, 12(2), 509.

Lange, F., & Dewitte, S. (2023). Non-monetary reinforcement effects on pro-environmental behavior. *Journal of Economic Psychology*, *97*, 102628. https://doi.org/10.1016/j.joep.2023.102628

McCowan, T. (2020). The impact of universities on climate change: a theoretical framework. (Transforming Universities for a Changing Climate, Working Paper Series 1). Climate-U, UCL Institute of Education: London, UK. (2020) , 55. https://www.climate-uni.com/resources

Odhiambo, E. W., Waiganjo, A. & Simiyu, N. (2023). Incentivizing employee pro-environmental behaviour: harnessing the potential of green rewards. *African Journal of Empirical Research.* 4 (2) 601-611

Ojo, A.O., Raman, M. & Downe, A.G. (2019), Toward green computing practices: A Malaysian study of green belief and attitude among information technology professionals. *Journal of Cleaner Production*, 224(9), 246-25.

Okpidi-Urhib, E. (2023). Green library initiative in Nigeria: Insights and levels of implementation in academic libraries. *Library Philosophy and Practice* 1(1), 1-10.

Rafie, S. K., Sheikh Abdul, S. K. & Mutalib, A. Z. (2021). Environmental sustainability practices in rural libraries. *International Journal of service Management and Sustainability,* 6(1), 171-181.

Rajapaksa, D., Gifford, R., Torgler, B., Garcia-Valiñas, M., Athukorala, W., Managi, S., & Wilson, C. (2019). Do monetary and non-monetary incentives influence environmental attitudes and behavior? Evidence from an experimental analysis. *Resources, Conservation and Recycling*, *149*, 168-176. https://doi.org/10.1016/j.resconrec.2019.05.034

Rayner, J., & Morgan, D. (2018). An empirical study of 'green' workplace behaviours: ability, motivation and opportunity. Asia Pacific Journal of Human Resources, 56(1), 56–78. https://doi.org/10.1111/1744 7941.12151

Steg, L. (2018). Limiting climate change requires research on climate action. *National Climate. Change* 8, 759–761

Steinhorst, Julia & Klöckner, Christian. (2017). Effects of monetary versus environmental information framing: Implications for long-term pro-environmental behavior and intrinsic motivation. *Environment and Behaviour*. 50.

Thondhlana, G., & Hlatshwayo, T. N. (2018). Pro-environmental behaviour in student residences at Rhodes University, South Africa. *Sustainability* 10(8), 1–19. https://doi.org/10.3390/su10082746

Tsymbaliuk, S., Vasylyk, A. & Vasylyk, K. (2022). Staff motivation for green behaviour and environmental initiatives. *The Eurasia Proceedings of Educational & Social Sciences (EPESS)*, 224, 78-83.

Whitmarsh, L. & O'Neill, S. (2019). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology,* 30, 305-314.

Woo, E. J. (2021). The necessity of environmental education for employee green behavior. *East Asian Journal of Business Economics* (EAJBE), 9(4), 29–41.

Zhang, W., Xu F., &Wang, X. (2020). How green transformational leadership affects green creativity: creative process engagement as intermediary bond and green innovation strategy as boundary spanner. *Sustainability.* 1(2), 38-41. doi: 10.3390/su12

ACCESS AND UTILIZATION OF LIBRARY INFORMATION RESOURCES FOR ACADEMIC ACTIVITIES BY STUDENTS OF FEDERAL COLLEGE OF EDUCATION (SPECIAL) OYO, OYO STATE, NIGERIA

Romoke Opeyemi QUADIR
Nigerian Defence Academy, Kaduna

Oladele Seyi OYEDEPO
Seyi Farms, Oro, Kwara State

Abu YUSUFU
Ahmadu Bello University, Zaria

Abdulmuta'ali Oyedeji ABDULKADIR
Federal University Dutsin-Ma, Katsina State, Nigeria

Abstract

The study investigated access and utilization of information resources for academic activities by visually impaired students of federal college of education (special) Oyo, Oyo state. Nigeria. Four research objectives were raised to; determine the information needs of visually impaired students for academic activities; identify the information resources available for of visually impaired students for academic activities; determine the means by which visually impaired students access information resources for academic activities; and identify the challenges faced by visually impaired students for academic activities .Quantitative research methodology and survey research design was adopted. Population comprised 65 visually impaired students of FCEs Oyo, Nigeria. Total enumeration sampling technique was utilized for sample selection. Self-developed closed ended questionnaire was used as instrument for data collection. The collected data were analyzed using frequencies and percentages. Findings revealed the information needs of visually impaired students, with a strong emphasis on academic support, career guidance, and adaptive strategies for coping with their visual disability. The means through which visually impaired students access information resources for academic activities include using Braille books, educational radio/TV programmes among others. The study concluded that visually impaired students have a wide range of information needs that extend beyond traditional academic support. It was recommended that Efforts should be made to ensure the equitable availability and accessibility of information resources in various formats (Braille, audio, large print, digital) across all educational settings among others.

Keywords: Academic Activities, Accessibility, Information Resources, Utilization, Visually Impaired Students

Introduction

Information plays a crucial role in both students' lives and the broader society, especially for individuals with special needs. In the 21st century, the information revolution has introduced materials in various formats, making information more accessible and vital for societal development. Experts like John and Craig (2018) emphasize that information systems are an ever-

expanding discipline of significant relevance, transforming raw data into knowledge that can drive change. As Jonathan and Udo (2013) note, information results from processing and organizing data to enhance understanding, positioning it as a catalyst for economic growth alongside capital, labour, and raw materials. Building upon the pivotal role of information as a catalyst for economic growth, it becomes evident that providing timely and accessible information is equally essential in the context of libraries. Just as organized data drives development, libraries aim to deliver the right resources at the right time to meet the diverse needs of all users, including those with disabilities such as visual impairment.

The provision of appropriate information is a fundamental goal of libraries, aiming to deliver the right resources at the right time and in suitable formats for all users, including those with disabilities such as visual impairment. This emphasis on accessible information is especially critical given that, according to the World Health Organization (2014), there are approximately 285 million people worldwide with visual impairments, predominantly in developing countries. For students with visual impairments in higher education institutions like Federal College of Education (Special) in Oyo, access to tailored information resources that address their unique needs is essential to support their academic success and mobility.

Understanding information needs involves recognizing gaps between available knowledge and what is required to fulfill specific goals or solve problems. Researchers such as Mohammed (2011); Abdulkadir (2016); Bamidele (2019 described these needs as arising from perceived shortfalls or unsatisfactory situations that motivate individuals or groups to seek relevant information. These needs are dynamic, context-dependent, and influenced by personal perceptions, cognitive and emotional states, and situational factors. Effective information seeking and use hinge on identifying these needs accurately and providing suitable resources to bridge the knowledge gaps.

Information resources encompass a wide range of materials and tools, both tangible and intangible, hat support research, decision-making, and learning. For students with special needs, especially at institutions like FCE Oyo, accessible resources-such as print, electronic materials, databases, experts, and methodological tools - are essential to foster inclusive education. These resources facilitate research activities and development projects, utilizing various strategies and techniques, including visual aids, methodologies, and technology, to meet diverse information needs. The final stage, information use, involves applying chosen sources effectively, influenced by factors like availability, awareness, ease of access, and personal circumstances, ultimately enabling individuals to make informed decisions and enhance their understanding.

Statement of the Problem

Ensuring access and use of information resources by the visually impaired is extremely relevant because it promotes inclusivity, equal opportunities, and independence. It enables visually impaired individuals to participate fully in educational, professional, and social activities, thereby enhancing their quality of life. Additionally, accessible information resources support their academic and career pursuits, foster personal development, and contribute to social integration. Ultimately, it aligns with the principles of universal design and human rights, ensuring that

everyone has equitable access to knowledge and information regardless of physical abilities; and this aligns with information seeking.

The academic activities of visually impaired students are significantly affected by a range of challenges related to access and use of information resources. Many textbooks, scholarly articles, and learning materials are not available in accessible formats such as Braille, large print, or compatible digital formats, limiting their ability to independently engage with learning content. Insufficient access to essential assistive technologies like screen readers, magnification devices, and Braille displays further hampers their effective use of digital information. Additionally, there is often a lack of awareness and training among students and staff on how to utilize available accessible resources and technologies, which compounds the problem. Library resources and facilities are not be fully accessible, with limited accessible catalogues or reading spaces designed for visually impaired users. Studies such as Sunday (2015), Bashir (2019), Ahmed (2018), Belle (2020), Shehu (2022), portrayed that there are scarcity of literature specifically on access and utilization of library information resources for academic activities by visually impaired students of FCE (s) Oyo, Oyo State, Nigeria, hence, the justification for this study.

Objectives of the Study

The main objective of this research was to investigate access and utilization of library information resources for academic activities by visually impaired students of FCE (Special) Oyo, Oyo State, Nigeria. The specified objectives are to;

1. Ascertain the information needs of visually impaired students of FCE (Special) Oyo, Oyo State, Nigeria for academic activities.
2. Identify the information resources available for the visually impaired NCE students of (Special) Oyo, Oyo State, Nigeria.
3. Determine the means by which visually impaired students of FCE (Special) Oyo, Oyo State Nigeria access information resources in the college library.
4. Ascertain the level of utilization information of library resources by visually impaired students of FCE (Special) Oyo, Oyo State Nigeria.

Literature Review

Scholars have conducted studies which explored the information needs of students with special needs, for instance, Kojana & Mukuna (2025) affirmed that globally, the higher education landscape has experienced a shift in its population composition inspired by the diversity of students with disabilities. The article adopted qualitative approach. Purposive and random sampling were combined to select thirteen sample with vision impairment. Appreciative inquiry inspired the structuring of the semi-structured questions for both the narrative interviews and group discussions. Following the interpretive phenomenological analysis, three themes and six sub-themes were identified from three appreciative inquiry questions. The findings informed that students' orientation is used to acquaint students with the available support services and the campus environment. It recommended that it is essential to develop guidelines and disability policies to address disability issues in higher education. Support services must appreciate all students as they are to embrace diversity and equity.

Banda *et al.* (2025) stated Malawi has historically prioritized specialized education for visual and hearing impairments, neglecting minor learning difficulties. Qualitative research method which employed a case study design was used. The participants were ten visually impaired students, two special needs teachers, and two mainstream teachers. Data were collected through in-depth interviews, document review and classroom observation. Finding of the study revealed challenges to include issues included insufficient materials, inadequate teacher support, an unfriendly environment, and a lack of teacher training. Thematic content analysis identifies these challenges, leading to recommendations for mitigation and broader implications.

In another dimension, Horfall & Opara (2023) investigated the available information resources for the visually impaired in Nigerian Universities. Authors adopted descriptive survey for the study. 20 university libraries partook in the survey. Self- constructed online questionnaire was designed and distributed for data collection from Librarians using a simple random sampling technique. Descriptive statistics was used for data analysis. Finding revealed most studied university libraries lacked information resources for visually impaired students. Also, it identified that the inclusion of information resources for visually impaired persons will promote inclusive education and librarian's skills. The challenges hindering the availability of information resources to the visually impaired students were insufficient funds for maintenance, erratic power supply and possession of skills by the users among others. It recommended that campaign for inclusive education and the provision of information for visually impaired students.

Alabi and Okiki (2023) emphasized that assistive technologies are necessary for ensuring independent living and equal participation in an information-based society for people living with disabilities (PLWD). The study adopted quantitative research method and survey the research design. Population comprised of visually disabled students in four public universities in Nigeria. Using the total enumeration method, an online questionnaire was used to obtain information from 151 students. Finding showed that access to electronic resources, scanning/conversion of print resources to electronic formats and access to information on the Web were among the technology-based services provided to visually disabled students. COBRA, ZoomText, Supernova and Dragon Naturally Speaking are the most preferred assistive technologies (software). It recommended that Library administrators and university stakeholders should expedite actions on meeting the assistive technology needs of people living with visual disabilities. These actions should transcend mere policy formulation on the provision of assistive technologies to restructuring their services and spaces to accommodate assistive technologies as information service delivery tools for people with visual disabilities.

Aghauche *et al.*(2021) examined the provision of alternative formats of information resources for inclusive library services of visually impaired primary school pupils in Southeast Nigeria. The study adopted a descriptive survey research design. Population were 129 respondents, comprising of 125 visually impaired pupils and four librarians from the four special education centres in Southeast Nigeria. Two instruments were used for data collection - observation checklist, and interview guide. Data collected with the checklist were analyzed using frequency counts, while those from interviews were analyzed qualitatively and integrated into the discussion of findings. Findings showed that alternative formats of information resources such as Braille textbooks and audio collections were not provided in many subjects in the libraries under study. It concluded that the provision of alternative formats of information resources in special education centre libraries in Southeast Nigeria is inadequate. Based on the findings, it was recommended

among others that the government should have a written policy statement on the provision of alternative formats of information resources for the visually impaired so that it will serve as a guide for the provision of information resources to special education centres, in order to ensure inclusive library services for the visually impaired.

Methodology

Quantitative research methodology was adopted for the study. A survey research design was used. The population comprised of 65 visually impaired students of FCEs Oyo, Nigeria. Total enumeration sampling technique was utilized for sample selection of the entire population. Self-developed closed ended questionnaire was used as the instrument for data collection. The collected data were analyzed using frequencies and percentages. 50% was used as the benchmark for decision making.

Result and Discussion

Information Needs of Visually Impaired Students for Academic Activities

This objective sought to find out the information needs of visually impaired students for academic activities in Federal College of Education Special, Oyo, Nigeria. Table 1 comprised of the responses by the study respondents.

Table 1: Information needs of visually impaired students for academic activities

S/N	Information needs of visually impaired students for academic activities?	F	%
1.	Information needed to pass my examinations	51	85.00
2.	Information on Educational opportunities	49	81.67
3.	Information on coping with my visual impairment	55	91.67
4.	Information for completion of assignments	58	96.67
5.	Information on library use	56	93.33
6.	Information on current ICT trends	53	88.33
7.	Information on Career choices and vocation	57	95.00
8.	Information on sports and recreation	51	85.00

Source – Field Survey, 2025

Table 1- information needs of visually impaired students for academic activities presented the information needs of visually impaired students for academic activities. The data revealed that the most pressing information need for visually impaired students is information for the completion of assignments, with 96.67% of the respondents indicating this as a key requirement. 95% of the respondents identified information on career choices and vocation as one of the information needs. 93.33% of the respondents specified that information on library use as one of the need. 91.67% of the respondents expressed a need for information on coping with their visual impairment. 85% of

the respondents stated that information needed to pass examinations; and information on sports and recreation respectively as an information need. 81.67% identified information on educational opportunities.

The information needs by visually impaired students for their academic activities, are Information for completion of assignments, career choices and vocation, coping with their visual impairment, sports and recreation, current ICT trends, educational opportunities and Information needed to pass my examinations. This implies that students require a wide range of resources and support to address not only their academic requirements but also their personal, professional, and recreational interests. Educational institutions and resource providers should take these findings into consideration when developing and curating information resources and services to ensure that the diverse needs of visually impaired students are adequately met, empowering them to thrive in their academic pursuits and beyond.

The findings highlighted the diverse and multifaceted information needs of visually impaired students, with a strong emphasis on academic support, career guidance, and adaptive strategies for coping with their visual disability. These insights can inform the development of targeted resources and services to better address the unique needs of this student population. This is in conformity with the report of IFLA (2006), Kassim & Maduagwu, (2006) and Atinmo, (2012) who all agree that students with visual impairment need effective information service in as a basis for achieving academic excellence and for managing other aspects of their lives and to achieve integration into the society. This implies that addressing these diverse needs can contribute to a more holistic and inclusive educational experience for this student population.

Information Resources available for Visually Impaired Students for Academic Activities

This objective sought to ascertain the information resources available for visually impaired students for academic activities in Federal College of Education Special, Oyo, Nigeria.

Table 2- Information resources available for visually impaired students for academic activities

S/N	What information resources are available for visually impaired students for academic activities	Frequency	%
1.	Talking books/books on tape	15	25.00
2.	Large print books/magazines	46	76.67
3.	Braille books	20	33.33
4.	Braille-in-print	10	16.67
5.	Daisy reading software/materials	40	66.67
6.	Videos/DVD books	0	0.00
7.	Talking magazines/journals	0	0.00
8.	Educational radio / TV programs	43	71.67

Source - Field Survey, 2025

Table 2- information resources available for visually impaired students for academic activities showed that the available information resource for visually impaired students is large print books and magazines, with 76.67% of the respondents indicating access to this format. 71.67% of the respondents reported their availability. Daisy reading software and materials, with 66.67% of the respondents indicated it allow access to this technology. Braille books are available to 33.33% of

the respondents, suggesting that this format is less commonly provided compared to the other resources. However, the availability of braille-in-print, which combines braille and print in a single format, is much lower, with only 16.67% of the respondents reporting access to this resource.

A study by Abdullahi *et al*. (2020) conducted in Nigeria found that Braille books remain a primary means through which visually impaired student's access educational materials. The study emphasized the continued importance of Braille as a fundamental tool for these students to engage effectively with academic content. Also, Ojo and Adebowale (2019) observed that audio-based resources, such as talking books and books on tape, were widely utilized for accessing information. This finding echoed the significance of audio formats in providing alternative access to educational materials. Aliyu and Ibrahim (2018) highlighted the use of hybrid formats like Braille-in-print among visually impaired students in Nigeria. The study emphasized the benefits of such formats, which combine printed text with Braille, in catering to the diverse preferences and needs of visually impaired learners. This implies that equitable access to information and resources for visually impaired students, educational institutions and resource providers should re-evaluate the availability and diversity of information resources, with a focus on addressing the identified gaps and ensuring that a comprehensive range of accessible formats is readily available to meet the diverse needs of this student population.

Means used by Visually Impaired Students' to access Information Resources for Academic Activities

This objective sought to out determine the means through which visually impaired students' access information resources for academic activities in Federal College of Education Special, Oyo, Nigeria.

Table 3- Means used by visually impaired students' to access information resources for their academic activities

S/N	what means do visually impaired students access information resources for their academic activities	Frequency	%
1.	Through the use of Talking books/books on tape	43	71.67
2.	Through the use of large print books/magazines	15	25.00
3.	Through the use of Braille books	50	83.33
4.	Through the use of Braille-in-print	45	75
5.	Through the use of Daisy reading software/materials	10	16.67
6.	Through the use of Videos/DVD books	0	0.00
7.	Through the use of Talking magazines/journals	0	0.00

8.	Through the use of educational radio / TV programs	48	80.00

Source- Field Survey, 2025

Based on the information provided in Table 3 - means used by visually impaired students' to access information resources for their academic activities , the findings revealed that he primary mode of accessing information resources for visually impaired students is through the use of braille books, with 83.33% of the respondents indicating this as their primary means of accessing information. Similarly, 80% of the respondents' access information through the use of educational radio and TV programs. 75% of the respondents stated that they access information resources through this braille. 71.67% of the respondents stated that information resources is accessed through use of talking books and books on tape. This format, which provides audio recordings of text, enables visually impaired students to access a wide range of academic materials in a convenient and accessible manner. However, the use of large print books and magazines is less prevalent, with only 25% of the respondents reporting access through this format. The use of Daisy reading software and materials is relatively low, with only 16.67% of the respondents indicating their utilization.

According to a study by Salawu and Abubakar (2017), visually impaired students in Nigeria are accessing a diverse range of information resources, including Braille-based materials. The study emphasized the high utilization of Braille as a crucial resource for academic support among this population. Also, in a survey conducted by Yahaya *et al.* (2018), it was observed that visually impaired students in Nigerian universities heavily relied on educational media, such as radio and television programs, for accessing course content and materials. This finding reflects the high utilization of educational media as an accessible learning resource. In similar research by Abdulmalik and Oyelekan (2019) highlighted the significant utilization of audio-based materials, such as talking books and audio recordings, by visually impaired students in Nigeria. The study emphasized the importance of audio formats in providing alternative access to information and supporting academic activities.

Visually impaired students access information resources to support their academic activities, with a high utilization of Braille-based resources, educational media, and audio-based materials. The importance of providing a comprehensive range of accessible information resources and formats to cater to the varied needs and preferences of this student population. Addressing any gaps or under utilization of certain resources can help ensure that visually impaired students have equitable access to the information and tools necessary for their academic success.

Challenges faced by Visually Impaired Students' for Academic Activities

This objective sought to identify the challenges faced in accessing information resources by the studied visually impaired students for academic activities in Federal College of Education Special, Oyo, Nigeria.

Table 4- Challenges faced by Visually Impaired Students for Academic Activities
Source- Field Survey, 2025

Based on the information provided in Table 4- challenges faced by visually impaired students for

S/N	Challenges faced by visually impaired students for academic activities	Frequency	%
1.	Difficult to read standard printed textbooks and materials	40	66.67
2.	Trouble taking notes or following along with lectures presented on a board or screen	36	60.00
3.	Struggle to access online course materials or digital resources	55	91.67
4.	Find it challenging to participate in group projects or collaborative work	44	73.33
5.	Experience difficulties using library resources or finding research materials in accessible formats	32	53.33
6.	Feel limited in your ability to understand charts, diagrams, or other visual representations used in your courses	49	81.67
7.	Have concerns about accessing lab equipment or participating in activities requiring hands-on experiments	40	66.67
8.	Face challenges with time management or keeping up with assignment deadlines	37	61.67
9.	Feel that your visual impairment impacts your ability to take exams or assessments effectively	48	80.00
10.	Difficult to navigate the physical campus environment or locate classrooms and resources	32	53.33

academic activities, the findings revealed that the data reveals that the most significant challenge for visually impaired students is the struggle to access online course materials or digital resources, with 91.67% of the respondents indicating this as a major concern. 81.67% of the respondents indicated inability to understand charts and others as a challenge. A related challenge is the perception that their visual impairment impacts their ability to take exams or assessments effectively, with 80% of the respondents facing this concern. Participating in group projects or collaborative work is also a significant challenge, with 73.33% of the respondents finding it difficult. 66.67% of the respondents identified Reading standard printed textbooks and materials; and accessing lab equipment or participating in activities requiring hands-on experiments as a challenge respectively. Also, 61.67% of the respondents Time management and keeping up with assignment deadlines as a challenge. 60% of the respondents identified trouble taking notes or following along with lectures presented on a board or screen; highlighting the need for accessible lecture materials and note-taking tools or services to support visually impaired students. 53.33%

of the respondents indicated that experience difficulties using library resources or finding research materials in accessible formats; and difficulty navigating the physical campus environment or locating classrooms and resources as a challenge.

Visually impaired students studied face a wide range of challenges in accessing academic resources and materials, participating in collaborative activities, and fully engaging with course content, with the most significant hurdles being the inability to access online and digital resources, difficulty understanding visual representations, and barriers to using standard printed textbooks and materials. By addressing these challenges, educational institutions should create a more equitable and inclusive learning environment for visually impaired students, enabling them to thrive academically and reach their full potential.

A study by Onogimesike and Angba (2021) found that visually impaired students in Nigerian universities faced challenges in accessing course materials due to limited availability of accessible formats. The study emphasized the need for comprehensive accessibility measures to address these challenges and enhance their learning experiences. Research by Shaibu *et al*. (2024) highlighted the difficulties faced by visually impaired students in actively participating in various learning activities, such as group projects and practical sessions. The study suggested the importance of assistive technologies and inclusive teaching practices to facilitate their engagement in academic tasks. According to a survey conducted by Amaniampong & Nyavor (2021), visually impaired students encountered challenges in navigating both physical campus environments and digital platforms for online learning. The study emphasized the role of comprehensive accessibility measures, including accessible campus infrastructure and digital resources, in improving their educational outcomes.

This finding implies that addressing the challenges requires a comprehensive approach, involving the implementation of accessible technologies, the provision of specialized support services, and the fostering of inclusive teaching and learning practices.

Conclusion and Recommendations

The study concludes that visually impaired students primarily need information related to completing their academic tasks, emphasizing the importance of access to relevant and comprehensive resources to support their learning. Currently, available resources such as large print books and magazines are helpful, but there is a critical need for a wider variety of accessible materials, with Braille books being the primary means of access for many students. Addressing these specific needs highlights the necessity of providing accessible formats like Braille, improving support services, and fostering inclusive practices within educational institutions. By doing so, schools can create a more equitable learning environment that effectively meets the unique informational and academic challenges faced by visually impaired students.

Based on findings, it is recommended that; to support visually impaired students effectively, schools should invest in a diverse range of accessible resources such as Braille books, talking books, audio materials, and assistive technologies, while governments should prioritize funding for producing and distributing these materials and providing financial aid to schools for assistive devices. Additionally, schools need to implement comprehensive training programs for

teachers and staff to better understand the challenges faced by these students and develop inclusive teaching strategies. Promoting a culture of inclusivity through collaboration and peer support is also essential to ensure visually impaired students can participate fully in academic and social activities, fostering a more equitable and supportive learning environment.

References

Abdullahi, A., Yahaya, H., & Mohammed, A. (2020). Braille as a learning medium for visually impaired students in Nigeria. Journal of Visual Impairment & Blindness, 114(2), 151-160.

Abdulmalik, A. M., & Oyelekan, O. S. (2019). Audio-based materials for visually impaired students in Nigerian universities. *Library Philosophy and Practice*, , 1-12.

Aghauche, E.E., Udem, O.K., Aghauche, S.I. (2021). Provision of Alternative Formats of Information Resources for Inclusive Library Services of Visually Impaired Primary School Pupils in Southeast Nigeria, Library Philosophy and Practice e-journal. Accessed from https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=9237&context=libphilprac

Amaniampong, P. & Nyavor, M. (2021). Challenges of visually impaired students in the use of virtual learning platforms in Wesley College of Education in Ghana. *International Journal of Research Studies in Education*, 10(6), 21-31

Alabi, A.O. & Okiki, O.C. (2023). Assistive technologies (AT) preferences of people living with visual disability as information access tools in academic libraries. Accssesd from https://ijkcdt.journals.publicknwledgeproject.org/ijkcdt/index.php/ijkdt/article/download/767/387

Aliyu, A. A., & Ibrahim, U. (2018). The use of hybrid formats by visually impaired students in Nigerian universities. *Information Development*, 34(4), 356-366.

Atinmo, M. I. (2012). Strategies for improving library and information services for people with visual impairment in Nigeria. *Annals of Library and Information Studies*, 59(1), 45-50.

Bamidele, I.A. (2019). Information needs of blind and visually impaired people. Accessed from https://www.researchgate.net/publication/354601001_INFORMATION_NEEDS_OF_BLIND_AND_VISUALLY_IMPAIRED_PEOPLE

Banda, E. K., Chirwa, G.W., Nyoni, P. & Myrie, D.N. (2025). Experiences of learners with visual impairment in the mainstream. *International Journal of Instruction*, 18, (1):1-16.

Horfall, M.N. & Opara, V.C. (2023). Availability of information resources for visually impaired students in universities libraries in Nigeria: a tool for inclusive education in Nigeria. *International Jurnal of Knowledge and Technology*, Accessed from https://www.researchgate.net/publication/370019751_Availability_of_Information_Resources_for_Visually_Impaired_Students_in_University_Libraries_in_Nigeria_A_Tool_for_Inclusive_University_Education

IFLA. (2006). Guidelines for library services to Braille users (IFLA Professional Reports No. 86). International Federation of Library Associations and Institutions.

Kassim, H., &Maduagwu, S. M. (2006). Provision of library and information services to the visually impaired in Nigeria. *Africa Journal of Cross-cultural Psychology and Sport Facilitation*, 8, 1-10.

Kojana, R.T. & Mukuna, K.R. (2025). The praxis of academic support for students with visual impairment: appreciative support in higher education. *E-Journal of Humanities, Arts, and Social Sciences (EHASS*), 6(2), 80-96.

Ojo, A. O., & Adebowale, S. A. (2019). Information needs and information-seeking behaviour of visually impaired students in Nigerian universities. *South African Journal of Libraries and Information Science,* 85(1), 1-11

Onogimesike, T.& Angba, O. (2021). Enhancing inclusive education through open and distance education for individuals with disabilities in Nigeria. Accessed from https://www.researchgate.net/publication/344714748_ENHANCING_INCLUSIVE_EDUCATION_THROUGH_OPEN_AND_DISTANCE_EDUCATION_FOR_INDIVIDUALS_WITH_DISABILITIES_IN_NIGERIA

Salawu, A., & Abubakar, J. (2017). Braille-based information resources and services for visually impaired students in Nigerian universities. *International Journal of Library and Information Science,* 9(2), 11-19.

Shaibu, L., Salaam I. & Salaam, S., Salaam, S. & Idoko, P. (2024). The use of audio-visual resources in the library as tools for improving learning and research among students of Federal University Oye-Ekiti. Accessed from https://www.researchgate.net/publication/387085051_World_Journal_of_Information_Technology_THE_USE_OF_AUDIO-VISUAL_RESOURCES_IN_THE_LIBRARY_AS_TOOLS_FOR_IMPROVING_LEARNING_AND_RESEARCH_AMONG_STUDENTS_OF_FEDERAL_UNIVERSITY_OYE-EKITI DOI:10.61784/wjit3008

Yahaya, A., Nasir, R., & Dantani, Y. (2018). Utilization of educational media by visually impaired students in Nigerian universities. *Journal of Visual Impairment & Blindness*, 112(3), 291-302.s

EFFECT OF ONLINE PRESENCE ON THE PROFESSIONAL BRANDING OF LIBRARIANS IN NIGERIA

Magnus Osahon Igbinovia
David Umahi Federal University of Health Sciences, Uburu

Emmanuel Okwu, PhD
Ignatius Ajuru University of Education, Port Harcourt, Nigeria

Abstract

This study explored the online presence of librarians and its effect on their professional branding, guided by four (4) specific research objectives, which are to determine the level of online presence of librarians in Nigeria, examine the professional contents of the librarians available online, ascertain the contents status of the librarians on various online platforms and examine the effect of online presence to your professional branding. The study was conducted using quantitative research methodology, while descriptive research design was employed to structure the research process. The population of the study was drawn from library professionals in Nigeria. Accidental sampling of the non-probability type was used to select participants from LIS professional online platforms (Facebook and Whatsapp). Questionnaire was used to elicit data from the respondents within a period of three (3) weeks. At the end of the data collection period, a total of 62 responses were retrieved and subjected to descriptive analysis. The study found out that the librarians had fairly high level of online presence, with Exist having the highest mean score (3.5) followed by Participate (3.4) and then Lead (3.2). The respondents' professional content available online include their contact information, facial image, publications/presentations, and subject specialization, areas of interest and expertise. The study also found that the most dynamic content of librarians online is Facebook followed by Google scholar, while most of them were not available on Flikr, Quora and they do not own a YouTube channel, Wiki account and personal blog/website. The study showed that online presence of the librarians greatly influences their professional branding. The study concluded that librarians should make conscious effort in building their online presence by putting their professional contents on the Internet and ensuring these contents are dynamic and up-to-date, so they can 'look good when googled. Part of the study's recommendations is that librarians should lead intellectual conversations online and make their online professional contents dynamic through regular updates.

Keywords: Digital footprint, Effect, Librarians, Online presence, Professional branding, Social media, Nigeria

Introduction

The effectiveness of library and information service delivery is largely dependent on the professionalism of librarians. They play a critical role in the organization of knowledge, and ought to have a place of pride in the community of professionals. However, there is still poor perception towards librarians by library users and other professionals which has necessitated the need for branding as a way of creating a positive image for themselves.

Professional branding is a form of self-branding which reflects how we want to be perceived by potential employers, employers, colleagues and others, which plays a vital role for long-term career success (Evans, 2017). By implication, how librarians are perceived as professionals, and their image projections are a function of their professional branding. This helps librarians to build beneficial relationship, establish reputation and take up responsibilities (Bartlett, 2015). Other relevance of professional branding to librarians includes helping them better communicate their value, gives competitive advantage (Edmiston**,** 2014), builds relationship (de Oliveira Silva, 2015), influences employability (Lancaster, 2013), and stimulate personal and career success (Salih, 2021). With the advancement in Web 2.0 which enhances social communication, professionals like librarians are now adopting these innovative tools for both personal and professional engagements. These online engagements give them an identity in the global community through their online presence.

Online presence of professionals refers to their existence in an online environment and how they conduct themselves there (Beckingham, 2019). The author further added that having a negative or inappropriate online personal presence can harm one's professional reputation as well as digital identity. Online presence should move beyond mere existence to committed participation and making effort to lead in an online space (Lewis, 2018). These activities help to form an impression about the professional which is necessary for professional branding. Thus, online presence provides an avenue for librarians to engage in professional branding which puts them in a better light in the society. This study therefore explores the effect of online presence on the professional branding of librarians in Nigeria.

Statement of Problem

Regardless of the perceived relevance of online presence for professional branding and identity of librarians, most librarians are not optimally utilizing social media platforms to project their professional image. An observation of most social media profiles of librarians in Nigeria does not adequately reflect their professional status, implying that they are not taking advantage of social media for conscious projection of professionalism. This adversely affects public perception of librarianship. Also, perusal of scholarly literature shows a dearth of research investigating the effect of online presence on professional branding of librarians, particularly in Nigeria, were there seems to be relatively poor public perception of librarianship. This could be accounted for due to the poor public engagement and deployment of social media to project the profession and the professional. The study therefore examines the effect of online presence on professional branding of librarians in Nigeria.

Objectives of the Study

The main objective of the study is to examine the effect of online presence on professional branding of librarians in Nigeria. To achieve this, the four (4) specific objectives generated to guide the study are:

1. Determine the level of online presence of librarians in Nigeria,
2. Ascertain the professional contents of the librarians available online, and
3. Examine the effect of online presence on the librarians' professional branding.

Literature Review

As libraries changes alongside civilization and technological advancements (Igbinovia. 2016), librarians as managers of these libraries are expected to change in the light of current realities in order to maintain relevance. As such, Raslin in Ahmad et al. (2016) emphasized that a competent library and information management must foster and encourage change in accordance with new media, not halt its progression. Otherwise, we will fall behind and lose our relevance. In adopting new media for personal and professional engagements, librarians become visible to the global community, through their online presence. According to Forbes (2017), online presence of professionals involves the cultivation of social media profiles and footprint in line with the professional's goal. It also involves the formation of a professional identity online.

Lewis (2018) in asserting the relevance of online presence for professionals noted that if there is no record of your professional activities, products, or successes on the internet, you do not exist to anyone who does not know you in person. However, the author added that online presence can go well beyond basic existing, in ways that are intellectually stimulating and professionally helpful. Thus not having an online presence according to Lima (2018) becomes detrimental for professionals like librarians. One major way professionals can have an online presence is to create public profile with contents like publication records and other professional achievements (Lima, 2018). These profiles are created on social media platforms like Facebook, LinkedIn, Twitter, Instagram, Pinterest, Quora, SlideShare, Academia.edu and blogs (Salih, 2021). These profiles bring the professional into online existence, after which the professional must engage further for better online presence and recognition.

When librarians have established their existence online, it is required that they participate in the activities of professional and academic online communities, and leading intellectual conversations online through blogging, publishing and reaching out to a greater audience online (Lewis, 2018). Thus, sharing scholarly outputs and engaging professional online communities with discussions of results is a major way to take a lead in the online environment. Lima (2018) noted that professionals can use social media to announce their publications, share links to the publication and engage people with discussion regarding the publication, among other non-academic use of social media like haring text and visual images. It is therefore suggestive that librarians' utilization of social media platforms influences their level of online presence. Their engagement online must portray them as a professional brand.

An understanding of branding was given by Kenton (2023) who asserted that a brand is a product or a business that has a distinct identity in the perception of consumers. The brand is created through elements of design, packaging, and advertising that, as a whole, distinguish the product from its competitors. Kenton added that personal brands are built through social media posts, sharing images and videos, and conducting meet-and-greets. It becomes necessary to have interactions on social media that puts librarians in the good perception of people. It is in line with this assertion that Forbes (2017) noted that it is each individual's job to proactively protect and portray online identities that are consistent with our best selves. Branding has become essential for librarians in order for them to fit into the society, create a positive image of themselves as professionals and projecting their value (Eke, 2012). This professional branding could be influenced by online presence or social media activities (Lima, 2018). However, there is still

paucity of scholarly investigation showing the effect of online presence on professional branding especially of librarians in Nigeria, hence this study.

Methodology

. The study was conducted using quantitative research methodology, while descriptive research design was employed to structure the research process. Due to the nature of the variables been investigated, the use of online survey became necessary so that participants of the study (library professionals) would be drawn from LIS professional online platforms (Facebook and Whatsapp) in Nigeria. Therefore, the population of the study was drawn from 'online-active' library professionals in Nigeria. Accidental sampling of the non-probability type was used to select participants for the study, given the ease of access to respondents and relevance to the study's focus. The questionnaire for the study was converted to Google form as the means for data collection. The measuring items in the questionnaire were generated based on contents from related literature. The scale for online presence was divided into three sub-variables, exist, participate and lead, in line with Lewis (2018) levels of online presence. The questionnaire was validated by two experts in Library and Information Science Profession. Their corrections were effected to have a clean draft of the instrument. Data was collected by the researchers and benchmark of 3.5 and above was regarded positive and accepted, while items with less than 3.5 was regarded negative.

Results and Discussion

A total of 62 responses were retrieved within the data collection period, and were subjected to descriptive analysis of frequency, percentage and mean, as presented and discussed in this section.

Objective 1: Determine the level of online presence of librarians in Nigeria

Table 1: Level of online presence of librarians

S/N	ITEMS	1	2	3	4	5	Mean
Exist							
1	Provide basic biographical information	5 (8%)	6 (10%)	12 (20%)	22 (36%)	16 (26%)	3.6
2	Provide a broader context for your publications or conference presentations	7 (11%)	8 (13%)	12 (19%)	20 (32%)	15 (24%)	3.5
3	Facilitate contact to grow your professional network	8 (13%)	3 (5%)	13 (21%)	22 (35%)	16 (26%)	3.6
4	Provide a narrative for a potential employer	8 (13%)	10 (16%)	16 (26%)	21 (34%)	7 (11%)	3.1
5	Provide access to your outputs: publications, presentations, code, teaching materials, etc	6 (10%)	8 (13%)	13 (21%)	18 (29%)	17 (27%)	3.5
Exist Mean Score = 3.5							
Participate							

6	Initiate contacts to grow your professional network	3 (5%)	10 (16%)	10 (16%)	25 (40%)	14 (23%)	3.6
7	Publicize accomplishments	8 (13%)	8 (13%)	15 (24%)	21 (34%)	10 (16%)	3.3
8	Elicit feedback	8 (13%)	12(20%)	13(21%)	19(31%)	9(15%)	3.1
9	Provide feedback	7(11%)	14(22%)	11(18%)	21(34%)	9(15%)	3.2
10	Participate in intellectual discussions	4(6%)	6(10%)	14(22%)	19(31%)	19(31%)	3.7
Participate Mean Score = 3.4							
Lead							
11	Disseminate your findings or views to academics online	5(8%)	9(15%)	8(13%)	24(38%)	16(26%)	3.6
12	Disseminate your findings or views to non-academics online	7(11%)	11(18%)	9(15%)	22(35%)	13 (21%)	3.4
13	Initiate intellectual discussions	15(24%)	9(15%)	16(26%)	10(16%)	12(19%)	2.9
14	Create professional online communities	7(11%)	12 (20%)	15(24%)	15(24%)	13(21%)	3.2
`15	Maintaining a blog and publishing in other people's blog	17(27%)	13(21%)	14(22%)	9(15%)	9(15%)	2.7
Lead Mean Score = 3.2							
GRAND MEAN = 3.3							

The Table 1 examined the level of online presence of the librarians based on three levels of exist, participate and lead. With a criterion mean of 3.0, the level of online presence of the librarians is considered to be high across the different dimensions or levels. However, the result suggests that the librarians exist more on online platforms (with mean sore of 3.5) more than they participated (with mean sore of 3.4). However, the close range in mean score seems to suggest that existing online could automatically stimulate some form of participation. As a way of existing online, the respondents' had basic biographical information online, they facilitate contact in a bid to grow their professional network and make visible their academic activities and engagements. This could account for their high level of participation in intellectual discussions. This study aligns with that of Onuoha (2013) which revealed that in utilizing social media, librarians in Nigeria read other people's conversation, join discussion groups, and ask questions, among other things. This implies that the librarians exist and participate in online activities that could showcase their presence.

The study also revealed that the respondents engage in online activities with greater commitment (lead), although not as much as they exist or participate. However, within the lead sub-construct, the study revealed that the respondents do not initiate intellectual discussions (since the mean score is below the criterion mean of 3.0), even though they participate in such discussions

as seen in the participate sub-construct. The respondents also do not maintain a blog nor publish in other people's blog. This could be due to the cost and technicalities required in maintaining a blog. While blogging is a way of creating an identifiable brand for/by librarians (Maxwell, 2019), it has also been a means of professional development by librarians (Miller, 2013), which improves their self-image. However, the basic technical skills required in blogging would deter librarians from maintaining a blog for professional branding (Maxwell, 2019). This finding contradicts that of Omini and Osuolale (2019) were blog was one of the most utilized social media platforms by librarians. Although, the purpose of utilizing blogs in the study of Omini and Osuolale was for promoting library and information resources and services, which differs from the context of this study.

With a grand mean score of 3.3 against the criterion mean of 3.0, the librarians who participated in this study are considered to have a fairly high level of online presence. Although there is a dearth of research on the online presence of librarians, with which to support or refute this finding; we can take a clue from librarians' utilization of social media platforms, which could reflect their online presence. Previous studies like that of Akporhonor and Fasae (2020) which show that librarians highly utilize social media platforms suggests a high level of online presence. It can be implied from the result of this present study that librarians in Nigeria exist and participate in activities that leave their digital footprint online but they do not display a relatively high extra commitment required to lead online engagements.

Objective 2: Ascertain the professional contents of the librarians available online

Table 2: Professional contents of the librarians available online

S/N	Professional Content Available Online	Unavailable	Out of date/ incomplete	Up to date	Mean
1	Basic biography	10(16%)	11(18%)	41(66%)	2.5
2	Image of your face	7(11%)	13(21%)	42(68%)	2.6
3	Contact information	4(6%)	9(15%)	49(79%)	2.7
5	Research overview	9(15%)	15(24%)	38(61%)	2.3
6	List of projects/accomplishments	10(16%)	21(34%)	31(50%)	2.3
7	Downloadable CV/resume	27(43%)	24(39%)	11(18%)	1.7
8.	Subject specialization, areas of interest and expertise	8(13%)	11(18%)	43(69%)	2.6
9.	Access to your publications/presentations	6(10%)	11(18%)	45(72)	2.6
10	Access to your research code, data, etc.	8(13%)	18(29%)	36(58%)	2.5

The Table 2 shows the librarians' professional contents which are available online. With a criterion mean of 2.0 on a three point likert scale, all the items except 'downloadable CV/resume' had above the criterion mean. This implies that these professional contents are available online though at varying extent, with the exception of downloadable CV/resume. This study aligns with the notion that librarians are now engaging in scholarly communication which forms large part of their professional contents online. This makes their contact information, area of specialization and publications discoverable online. This is supported by Laskowska (2023)

who found a growing rate of publishing among the librarians, particularly in highly regarded publishing outlets and open access outlets, which increases discoverability of their publication and personal details contained in such publication like contact address. Other studies that found a high level of research productivity by librarians include Hollister and Jensen (2023), Hoffman et al. (2023), and Adetayo et al. (2023). This high scholarly output from librarians directly contributes to the availability of their professional contents available online.

Objective 3: Examine the effect of online presence to your professional branding

Table 3: Effect of online presence on your professional branding

S/N	Items	SA	A	D	SD	Mean
1	The nature of my posts affects people perception of me as a professional	33(53%)	19(31%)	8(13%)	2(3%)	3.3
2.	The online visibility of my resume and research output affects people's appraisal of my professional value.	29(47)	25(40)	6(10)	2(3)	3.3
3.	When my name is searched on google, my profile(s) rank among the first positions in the result list.	27 (43%)	21(34%)	11(18%)	3(5%)	3.1
4.	I prefer to collaborate and have professional relationships with people who are very visible online.	35(56%)	19(31%)	7(11%)	1(2%)	3.4
5.	People can easily access my official contact, educational background, current, past appointments, affiliations, publications, awards, etc through my different online platforms	34(55%)	18(29%)	9(14%)	1(2%)	3.4
6.	My presence online portrays my unique and professional qualities that has/can secure present/future jobs for me within my profession.	32(52%)	22(35%)	7(11%)	1(2%)	3.4
7.	I often regulate my presence online to assert a sense of control on what people know about me	25(40%)	23(37%)	11(18%)	3(5%)	3.1
8.	Sharing compelling contents online give value and appeal to my professional audience	26(42%)	24(39%)	10(16%)	2(3%)	3.3
9.	My comments, messages and discussions online are consistent and clear, displaying my knowledge, skills and experience.	29(46%)	26(42%)	6(10%)	1(2%)	3.3
10.	I have experience an amount of professional success by been visible online	29(46%)	27(44)	5(8%)	1(2%)	3.4
GRAND MEAN = 3.3						

The result in Table 3 shows the effect of online presence on the librarians' professional branding. With a grand mean of 3.3 against the criterion mean of 2.5 on a four point likert scale, the study showed that online presence of the librarians greatly influences their professional branding. All items exceeded the criterion mean which means that they were all perceived by the respondents to be true. However, items with the highest mean score show that librarians' presence and engagements online impact on people's knowledge and perception of them, how people interact with them, as well as their success level as professionals. The finding from the study aligns with that if Eke (2012) that found librarians create digital footprint to optimize their professional branding through their presence and engagements in social media platforms.

The study is also supported by Waller in Khrulyov and Khrulyova (2020) who averred that creating a socially recognized, attractive, recognizable and recognized image of the librarians online helps improve professional branding. By implication, librarians in the quest to build their professional identity and brand must actively engage in social media platforms to make their presence felt in the global village

Conclusion and Recommendations

Librarians are vital part of the library system, and as professionals they must consider themselves as a brand that needs to be visible. Also, the 21st Century characterized by the advancement in technology which has made the world a global village demands that these librarians have active citizenship by being visible online through their engagement in various social media platforms, professional and scholarly engagements online. Thus, it is necessary for them to make conscious effort in building their online presence by putting their professional contents on the Internet and ensuring these contents are up-to-date, so they can 'look good when googled'. Their appearance online portends their value and reputation as professionals which reinforces their uniqueness and professional success. The study therefore recommended that Librarians should lead intellectual conversations online using various social media platforms and research in other social networking sites like ResearchGate and Quora. Librarians should make their online professional contents dynamic through regular updates, and provide exhaustive information on scholarly platforms. Also, librarians should develop their blogging skills in order to build and effectively maintain their personal blog; as such controls what is seen and perceived of them.

References

Adetayo, A. J., Oketunji, I., & Hamzat, S. A. (2023). Mentoring support for librarians' research productivity in southwestern Nigeria: A study of quantity of publications in quality outlets and online channels. *The Journal of Academic Librarianship*, 49(1), 102625. https://doi.org/10.1016/j.acalib.2022.102625.

Ahmad, R., Hashim, L., & Harun, N. (2016). Criteria for effective authentic personal branding for academic librarians in Universiti Sains Malaysia Libraries. *Procedia - Social and Behavioral Sciences*, 224(7), 452 – 458. http://dx.doi.org/10.1016/j.sbspro.2016.05.420

Akporhonor, B. A. & Fasae, J. K, (2020). Use of social media by librarians in promoting library and information resources and services in academic libraries in Ekiti and Ondo States, Nigeria. *Library Philosophy and Practice (e-journal).* Paper 4093. https://digitalcommons.unl.edu/libphilprac/4093

Bartlett, J. A. (2015). Your professional brand. *Library Faculty and Staff Publications*, paper 264. https://uknowledge.uky.edu/libraries_facpub/264

Beckingham, S. (2019). 3. Developing a professional online presence and effective network. In C. Rowell (Ed.), *Social Media in Higher Education* (1–). Open Book Publishers. https://books.openedition.org/obp/8541

De Oliveira Silva, A. H. (2015). Social branding: Online presence as an identity expression. *American International Journal of Contemporary Research*, 5(6), 165-171. https://www.aijcrnet.com/journals/Vol_5_No_6_December_2015/22.pdf

Edmiston**,** D. (2014). Creating a personal competitive advantage by developing a professional online presence. *Marketing Education Review*, 24(1), 21- 24.

Eke, H. N. (2012). Creating a digital footprint as a means of optimizing the personal branding of librarians in the digital society. *Webology*, 9(2), Article 100. http://www.webology.org/2012/v9n2/a100.html

Evans, J. R. (2017). Branding in perspective: self-branding for professional success. https://doi.org/10.1080/21639159.2017.1360146

Forbes, D. (2017). Professional online presence and learning networks: Educating for ethical use of social media. *International Review of Research in Open and Distributed Learning*, 18(7), 175-190. https://files.eric.ed.gov/fulltext/EJ1163210.pdf

Hollister, C. V. & Jensen, J. M., (2023). Research productivity among scholarly communication librarians. *Journal of Librarianship and Scholarly Communication* 11(1). https://doi.org/10.31274/jlsc.15621

Igbinovia, M. O**.** (2016). Emotional self-awareness and information literacy competence as correlates of task performance of academic library personnel. *Library Philosophy and Practice, (e-journal),*Paper 1370. http://digitalcommons.unl.edu/libphilprac/1370

Kenton, W, (2023). Brand: Types of brands and how to create a successful brand identity**.** https://www.investopedia.com/terms/b/brand.asp

Khrulyov, A. & Khrulyova, A. (2020). Professional branding of a university lecturer. SHS Web of Conferences 87, 00012 (2020) ICTP 2020. https://doi.org/10.1051/shsconf/20208700012

Lancaster, T. (2013). Using professional online presences to enhance computing student employability. The Higher Education Academy. 2nd Annual Higher Education Academy Conference in Science, Technology, Engineering and Mathematics, University of Birmingham.

Laskowska, A. (2023). Publications patterns of academic librarians from Norwegian Higher Education Institutions 2016-2020. *New Review of Academic Librarianship*, 29(4), 327-356. https://doi.org/10.1080/13614533.2022.2138478

Lewis, S. (2018). Developing Your Online Presence NACS Professional Development

Workshop - May 2, 2018. Retrieved from https://www.colinphillips.net/wp-content/uploads/2015/07/online_presence_worksheet.pdf

Lima, M.R.M. (2018), Professional Online Presence and Social Media. *CSA News*, 63: 28-29. https://doi.org/10.2134/csa2018.63.0918

Maxwell, L. (2019). A librarian's journey in blogging. *American Library Association TechSource*, 55(5) https://journals.ala.org/index.php/ltr/article/view/7069/9629#:~:text=A%20professional%20blog%20can%20also,and%20students%20around%20the%20world

Miller, L. (2013). Librarians are attracted to blogs that support professional continuing education. *Evidence Based Library and Information Practice*, *8*(3), 76–78. Retrieved from https://doi.org/10.18438/B85C9H

Omini, E. U. & Osuolale, K. A. (2019). Utilization of social media platforms by librarians for promoting library resources and services in Nigerians' tertiary institutions in Cross River State. *Global Journal of Educational Research*, 18, 1-8. https://dx.doi.org/10.4314/gjedr.v18i1.1

Onuoha, U. D. (2013). Librarians' use of social media for professional development in Nigeria. *Information Management and Business Review*, 5(3), 136-143.

Salih C K. (2021). Personal branding for library professionals. International Online Conference 2021 on Transformation of the Library Ecosystem: Terrains and Trajectories C.H. Mohammed Koya Library, University of Calicut.

USE OF INFORMATION TECHNOLOGY TOOLS BY POSTGRADUATE STUDENTS FOR RESEARCH IN FEDERAL UNIVERSITY LIBRARIES IN NORTH CENTRAL STATES OF NIGERIA

Shuga, Yusuf
Ahmadu Bello University, Zaria.

Professor Tijjani Abubakar
Ahmadu Bello University, Zaria.

Dr. Babangida Umar Dangani
Ahmadu Bello University, Zaria.

Professor Abu Yusufu
Ahmadu Bello University, Zaria.

Abstract

This study investigates the use of information technology tools for research by postgraduate students in Federal University Libraries, North Central State of Nigeria. The research was guided by two research objectives to: Identify the types of Information Technology Tools used by Postgraduate students for research in Federal University Libraries in North Central States of Nigeria and examine the extent of use of information technology tools by postgraduate students for research in Federal University Libraries in North Central States of Nigeria. Quantitative research method was adopted and cross-sectional survey design was used to explore the population studied. The population comprised of 19, 342 postgraduate students across seven universities in the North Central States of Nigeria, out of which 968 postgraduate students were sampled using simple random sampling technique. Closed ended questionnaire was used as the research instrument for data collection. Frequency, percentage, mean and standard deviation were used for data analysis. The study found that: The types of Information Technology Tools used for research by Postgraduate students in Federal University Libraries in North Central States of Nigeria were data analysis software, research databases and online libraries. The study recommended that the university libraries and ICT unit should enhance the availability and accessibility of Reference Management Software, Collaboration and Communication Tools, Academic Writing Tools and Virtual Learning Environments across all federal universities to ensure that all postgraduate students have consistent access to these essential tools. The universities management should integrate specialized training programs on data collection, academic writing, citation management, dissemination of research, and enhancing collaboration into the curriculum that focus on the effective use of IT tools for data analysis, data collection, and literature review to ensure students are proficient in these critical areas. The school of postgraduate studies should continue to promote the use of Reference Management Software, Collaboration and Communication Tools, Academic Writing Tools, and Virtual Learning Environments (VLEs) by providing regular updates, tutorials, and best practice guides to keep students informed and skilled in using these tools.

Keywords: Federal University Libraries, Information Technology, North Central States, Nigeria, Research, Tools, Utilization

Introduction

Information technology tools have revolutionized the way postgraduate students conduct research by providing access to academic resources, facilitating efficient citation management, streamlining writing processes, and enhancing collaboration with peers and mentors, these tools empower students to engage in high-quality research and contribute significantly to their respective fields of study. As technology continues to advance, it is essential for postgraduate students to stay informed about emerging tools and applications available, as they can greatly impact the success of their academic endeavors.

Information technology (IT) tools have become indispensable resources for postgraduate students who engaged in scholarly pursuits. With the rapid advancement of digital technologies, these tools offer a wide range of benefits, facilitating efficient data collection, analysis, collaboration, and dissemination of research. The use of IT tools in the academia has transformed the landscape of research and has become integral to the scholarly process. Moreover, IT tools such as citation management software streamline the process of organizing and citing references, ensuring accurate and consistent citation styles throughout academic papers (Bruns & Stieglitz, 2019).

Furthermore, IT tools empower postgraduate students to analyze and interpret complex data sets efficiently. Statistical analysis software, data visualization tools, and machine learning algorithms aid in the exploration of research questions and facilitate evidence-based decision-making (Chinomona, 2021). These tools enable students to uncover patterns, trends, and correlations within their data, thereby enhancing the rigor and validity of their research findings. This virtual collaboration transcends geographical boundaries, enabling diverse perspectives and expertise to be incorporated into research projects, thereby enriching the quality and impact of the research.

However, the use of information technology tools by postgraduate students for research presents challenges, which includes; technological barriers, such as limited access to hardware and software, insufficient IT skills, and compatibility issues, may hinder effective utilization of these tools (De Wever et al., 2020). The integration of information technology tools into the research activities of postgraduate students has revolutionized research processes, promoting efficiency, collaboration, and innovation.

Statement of the Problem

Information technology tools have transformed the academic landscape, presenting both opportunities and challenges for postgraduate students in Federal Universities. While information technology tools have the potential to enhance scholarly activities, there is a need to understand the extent to which postgraduate students are utilizing these tools. ICT tools play a critical role in postgraduate research by streamlining key processes such as topic identification, literature review, data collection, reference management, and data analysis. For topic identification, these tools provide access to global databases and trend analysis, helping researchers identify relevant and novel research areas.

Despite the significance of adopting information technology tools in enhancing postgraduate research, their level of utilization among students in Federal Universities in North-Central State of Nigeria remains uncertain. This underutilization not only affects the quality and efficiency of research outputs but also limits the students' competitiveness in a rapidly evolving academic and professional landscape. It is crucial to examine the current level of utilization of information technology tools by postgraduate students in these universities because research indicate that students' familiarity with and access to technology can significantly impact their engagement with scholarly activities (Kimmons, 2017).

Research has shown that technology integration positively affects students' learning outcomes and research productivity (Joo et al., 2017). However, the extent to which these tools are utilized and their impact on research remains insufficiently understood. Challenges such as inadequate access to IT infrastructure, varying levels of digital literacy, and socio-cultural factors specific to the region may hinder effective usage. These limitations not only affect the students' ability to conduct comprehensive research but also highlight the need for region-specific strategies to address these barriers. Furthermore, the diverse socio-economic landscape of Nigeria, including disparities in resource allocation and cultural influences, may shape the use and effectiveness of IT tools in research.

This research aims to address the current gap in understanding the use of information technology tools for research by postgraduate students in Federal Universities, North Central States of Nigeria of Nigeria.

Objectives of the Study

The study aimed at achieving the following objective to:

1. Identify the types of Information Technology Tools used by Postgraduate students for research in Federal University Libraries in North Central States of Nigeria.
2. Examine the extent of use of information technology tools by postgraduate students for research in Federal University Libraries in North Central States of Nigeria.

Review of Related Literature

Types of Information Technology Used for research by Postgraduate Students

Postgraduate students rely heavily on information technology tools for various research, including research, writing, collaboration, and academic management. This paper aims to explore the different types of information technology used by postgraduate students and their significance in facilitating scholarly activities.

Reference Management Software: Reference management software allows postgraduate students to collect and organize references from various sources. They can import references directly from online databases, library catalogs, and websites, and store them in a centralized library. This feature ensures that students have a comprehensive collection of relevant literature at their disposal. As mentioned by Niu and Hemminger (2012), reference management software simplifies the process of gathering and organizing references from multiple sources, making it easier for researchers to access and manage their literature. These software plays a crucial role in the research process for postgraduate students, aiding them in organizing, citing, and managing

their references efficiently. This software automates the process of creating bibliographies and citations, saving considerable time and effort for students. Reference management software, such as EndNote, Zotero, and Mendeley, is widely used by postgraduate students to organize and manage bibliographic references. These tools allow users to import, organize, and cite references in their research papers and dissertations efficiently (Sharma et al., 2017). By automating the citation process and providing comprehensive citation styles, reference management software simplifies the task of creating accurate and consistent reference lists.

Furthermore, reference management software facilitates the citation process for postgraduate students. When writing academic papers or theses, students need to cite their sources accurately and consistently. Reference management software automates the creation of citations and bibliographies in various citation styles, such as APA, MLA, or Chicago. By using these software tools, students can avoid manual formatting errors and ensure compliance with specific citation guidelines. According to Dror and Schmidt (2018), reference management software assists in generating citations and bibliographies, ensuring adherence to the required citation style.

Moreover, reference management software enables postgraduate students to insert citations directly into their documents while writing. These tools often integrate with word processors, allowing users to search and select references from their libraries and insert them seamlessly into their text. This feature not only streamlines the writing process but also ensures accurate and consistent citation placement. As highlighted by Walker (2019), reference management software integrates with word processors, providing a convenient way for students to insert citations in their documents.

Additionally, reference management software aids in organizing and categorizing references based on specific projects or topics. Students can create folders or tags to group related references together, making it easier to navigate and locate specific sources when needed. This organizational feature enhances efficiency and helps students keep track of their research materials. As noted by Poulter and Jones (2014), reference management software allows users to create folders and tags for organizing their references, assisting them in managing their research materials effectively.

Reference management software plays a significant role in the research process for postgraduate students. It enables them to collect, organize, and cite references efficiently, saving time and ensuring accuracy. By automating the creation of citations and bibliographies, facilitating the insertion of citations while writing, and providing organizational features, reference management software enhances the productivity and effectiveness of postgraduate students in managing their research Databases and Online Libraries: research databases and online libraries play a crucial role in supporting the academic endeavors of postgraduate students. These resources provide access to a vast array of scholarly articles, research papers, books, and other academic materials, enabling students to conduct comprehensive literature reviews, engage in rigorous research, and stay up to date with the latest developments in their respective fields. Postgraduate students heavily rely on research databases and online libraries to access scholarly literature and academic resources. Platforms such as Google Scholar, JSTOR, PubMed, and IEEE Xplore enable students to search and access scholarly articles, conference papers, theses, and dissertations

(Robinson et al., 2017). These databases provide a vast repository of knowledge, enabling students to conduct comprehensive literature reviews and support their research endeavors.

Extent of use of information technology tools for research by postgraduate students

Access is the right or opportunity to use or benefit from something (Oxford University Press, 2017). In this study, access to ICTs use in research is the right or opportunity to use ICT facilities for research purposes. The use of diffusion of ICT among users is grounded in its usefulness and ease of use in their research. Thus, researchers will frequently or intensively use ICT facilities to collect and analyze and share research data. Again, the usefulness and ease of use of ICT facilities in various research methods and techniques will increase its use among researchers (Adeagbo et al., 2016; Arcila-Calderón et al., 2013; Bradbury & Borchert, 2010; Dutton & Meyer, 2009; Hellmers, 2009; Meyer & Dutton, 2009). For example, ArcilaCalderón et al. (2013) stated that 70.25% of researchers said ICT applications are 'useful' in research activities.

research into the access to ICT applications used for research has been based on its usage in research process or activity, research techniques or methods and access to specialized applications that are used to support research activities. The first addressed processes and activities such as communication and scientific collaboration; data collection, analysis and processing; and preservation and dissemination of data. For instance, Arcila-Calderón et al. (2013) noted that researchers used at least one ICT applications for scientific communication and collaboration, especially email (81.33%), archives and document sharing (62.97%) and social networks (62.34%). With the use of ICT applications in data collection, analysis and process more than half of the respondents (57.91%) stated they use database whilst (44.62%) used spreadsheets and software for data visualization. Last but not the least, in the area of preserving and disseminating data most of the respondents chose digital scientific journals (72.47%), a significant number of them also use online data storage (53.16%) and a few of respondents use restricted access storage and blogs (48.10%).

Similarly, Hellmers (2009) in her research to find out how researchers provided access to their data, noted that out of 826 respondents, 100 published data online, 62 deposited data in repositories, 75 submitted data for publishing, 200 allowed privately negotiated access, 30 provide via 3rd party and 25 of them indicated 'other'.

Likewise in Nigeria, Adeagbo et al. (2016) confirmed that 90% of the researchers made use of emails and 60% use Skype to communicate and collaborate with each other. Again, most (80%) of the respondents do not use reference management software however, less than 20% of the respondents use Mendeley. In addition, respondents revealed that they use shared calendars, emails, Wikispace and regular online meetings to keep members abreast of deadlines of deliverables. Moreover, researchers use ICT applications such as email (75%), SharePoint (40%), Online Forum (30%), Wikispace (25%), Dropbox (20%) and dedicated websites (5%) to share relevant information among team members.

Furthermore, research into the access to ICTs use in research is based on research techniques or methods used by researchers who employ ICT applications in qualitative, quantitative, database, video analysis, integrating and content analysis. Others include simulation,

visualizing, geographic and web metrics (Dutton & Meyer, 2009; Meyer & Dutton, 2009). For example, Meyer and Dutton (2009) found that out of 526 respondents, 205 (39%) of them use ICT applications for quantitative research, 179 (34%) use database ICT applications, 96 (18%) use ICT applications for qualitative research and 69 (13%) use visualization ICT applications in their research. However, the least were web metrics and video analysis where their usages were 44 (8%) and 22 (4%) respectively.

Another important access to ICTs use in research is to support research technologies or activities. This includes the use of programming languages or scripts and open source software to support research. They are specialized applications that some researchers use in a specific research investigation. For example, Bradbury and Borchert (2010) opined that 27.2% of respondents indicated they write computer programs or scripts to help them carry out their research. These respondents (n=254) use programming languages or scripts such as MATLAB (22), FORTRAN (20) and SQL (15) were the most selected response. With the open-source software, 29.1% of the respondents revealed that they use open-source software in their research activities whilst 48.4% and 22.4% indicated that 'they do not' and 'they do not know' respectively. They were further asked to give the names of the open-source software/applications they use in their research. The answers include R, LaTex, GIMP, ImageJ, 8 Open Office, Firefox, OpenCV and GNU. The rest include Inkscape, MikTek, MySQL, Ubuntu, VLC player, and Zotero.

The frequency of accessibility and usage of ICT facilities in research is an indicative tool used to measure and determine how these resources are utilized by students. Students have preferences in their effort to use ICT applications or resources to satisfy their research needs. These preferences could be due to differences in research methodologies, study programs, student's interest or the ease of use of electronic resources. In line with this, respondents were asked to indicate how frequently they accessed information communication technologies such as electronic resources; communication and collaboration applications; citation and compiling bibliography applications; research data management applications; data analysis applications and sharing and/or publishing in their conduct of research.

Methodology

Quantitative research methodology was adopted in this study. Cross-sectional sectional survey design was adopted for this study. This design allows the researcher to have clear understanding of the thoughts and opinions of the respondents under study. The population of the study comprised of 19,342 postgraduate students across seven Federal University Libraries in North Central States of Nigeria and 968 postgraduate students were sampled using simple random sampling technique. Closed-ended questionnaire was adopted as the instrument for data collection. The data collected were analyzed using descriptive statistics (frequency, percentage, mean, standard deviation). The benchmark mean of 60.00 and 3.00 for the likert's scale.

Result and Discussion

Type of Information Technology Tools used by Postgraduate students for Research in Federal University Libraries in North Central States of Nigeria.

Data on the Information Technology Tools used by Postgraduate students for research were collected. Frequency, percentage and mean were used. The summary of the analysis is presented in table1.

Table 1: Type of Information Technology Tools used by Postgraduate students for research in Federal University Libraries in North Central States of Nigeria

S/N	IT TOOLS	UNIABUJA	UNIJOS	FFULAFIA	UNILORIN	FULOKOJA	JSTFUNIM	FUTM	F	%	MEAN	SD
1	Reference Management Software	21	34	11	48	09	27	19	169	22.94%	24.14	13.07
2	Data Analysis Software	69	128	51	116	35	138	98	635	86.17%	90.71	38.29
3	research Databases and Online Libraries	51	83	42	67	28	93	77	441	59.84%	63.00	24.62
4	Collaboration and Communication Tools	16	24	06	25	13	18	17	119	16.15%	17.00	6.52
5	Academic Writing Tools.	31	23	14	31	34	21	23	177	24.02%	25.29	6.19
6	Virtual Learning Environments (VLEs)	49	12	22	26	14	32	40	195	26.46%	27.86	12.30

KEYS: F= Frequencies, % = Percentages, SD = Standard Deviation

The descriptive analysis of table1 reveals significant variation in the utilization of different types of information technology tools among postgraduate students in Federal Universities in the North Central States of Nigeria. Data Analysis Software stands out with a markedly high frequency (635) and percentage (86.17%), and its mean usage of 90.71, well above the benchmark mean of 60.00. indicating it is the most commonly used tool. research Databases and Online Libraries also demonstrated substantial utilization, with a frequency of 441, percentage of 59.84%, and a mean of 63.00, slightly surpassing the benchmark. In contrast, Reference Management Software (mean of 24.14), Collaboration and Communication Tools (mean of 17.00), Academic Writing Tools (mean of 25.29), and Virtual Learning Environments (mean of 27.86) which all fall below the benchmark, suggesting these tools are less frequently used among the students. The standard deviations highlight the variability in tool usage, with Data Analysis Software showing the greatest dispersion (SD = 38.29) and Collaboration and Communication Tools with east (SD = 6.52).

The findings indicate a clear preference among postgraduate students for certain types of information technology tools, particularly Data Analysis Software and research Databases and Online Libraries. These preferences suggest that students prioritize tools that directly facilitate data handling and access to scholarly resources, which are essential for conducting robust research. The high utilization of these tools reflects their critical role in the academic research process, likely due to their effectiveness in managing large datasets and providing comprehensive access to academic publications. The lower usage of tools such as Reference Management Software, Collaboration and Communication Tools, Academic Writing Tools, and Virtual Learning Environments indicates that while these tools are available, they are not as integral to the students'

research activities, possibly due to a lack of awareness, training, or perceived necessity. These findings are multifaceted. Universities and educational policymakers need to recognize the essential role of Data Analysis Software and research Databases in the research ecosystem and ensure that these tools are readily available and adequately utilized. Training programs to increase proficiency in these tools could further enhance their usage, effectiveness and provide quality research productivity (García-Peñalvo et al., 2021).

The underutilization of other IT tools suggests a potential gap in the students' research capabilities that could be addressed through targeted educational initiatives. Enhancing awareness and training for Reference Management Software, Collaboration Tools, Academic Writing Tools, and VLEs could equip students with a more comprehensive set of skills, ultimately leading to more efficient and collaborative research practices.

Extent of the use of information technology tools for Research by Postgraduate students in Federal University Libraries in North Central States of Nigeria.

Data on the extent of the use of information technology tools for research by Postgraduate students were collected. Frequency, percentage and mean were used. The summary of the analysis is presented in table 2.

Table 2: Extent of the use of information technology tools for Research by Postgraduate Students in Federal University Libraries in North Central States of Nigeria

S/N	IT TOOLS	VERY HIGH EXTENT	HIGH EXTENT	UNDECIDED	VERY LOW EXTENT	LOW EXTENT	F	%	MEAN	SD
1	Reference Management Software	143	94	108	147	245	737	100.00	2.77	1.50
2	Data Analysis Software	235	258	104	97	43	737	100.00	3.96	0.94
3	research Databases and Online Libraries	195	298	100	69	85	737	100.00	3.67	1.08
4	Collaboration and Communication Tools	59	55	112	260	246	732	100.00	2.02	1.30
5	Academic Writing Tools.	56	81	103	224	273	737	100.00	1.98	1.28
6	Virtual Learning	57	80	103	252	240	732	99.32	2.01	1.28

	Environments (VLEs)									

KEYS: F= Frequencies, % = Percentages, SD = Standard Deviation

Based on a benchmark of 3.00, the descriptive analysis of the table indicates that all items are utilized to varying extents by postgraduate students in the use of information technology tools for research, with the total frequency (F) for each item reflecting complete participation (100%). However, Data Analysis Software (Mean = 3.96) and Research Databases and Online Libraries (Mean = 3.67) show extensive use, with their mean values significantly above average, suggesting that students are comfortable and frequently use these tools. In contrast, Reference Management Software (Mean = 2.77), Collaboration and Communication Tools (Mean = 2.02), Academic Writing Tools (Mean = 1.98), and Virtual Learning Environments (VLEs) (Mean = 2.01) have lower mean scores, indicating less frequent use. This highlights a need for improved training and support in these areas to enhance students' capabilities and align them closer to the benchmark. The standard deviation values, particularly high in Reference Management Software (SD = 1.50), suggest significant variability in student usage levels, indicating uneven use and familiarity across the student population.

The findings reveal significant disparities in the usage of information technology tools among postgraduate students in federal universities in the North Central States of Nigeria of Nigeria. Data Analysis Software and research Databases and Online Libraries stand out with high mean values of 3.96 and 3.67, respectively, indicating that students are relatively proficient and frequently use these tools. This suggests that these areas are likely receiving more focus and resources, possibly due to their direct relevance to research activities. On the other hand, Reference Management Software, Collaboration and Communication Tools, Academic Writing Tools, and Virtual Learning Environments (VLEs) have mean values below 3.00, highlighting areas where students are less proficient and these tools are underutilized.

The implications of these findings are critical for educational policymakers and university administrators. The lower proficiency and usage of tools such as Reference Management Software, Collaboration and Communication Tools, Academic Writing Tools, and VLEs indicate a need for targeted interventions to enhance student capabilities in these areas. Improving training programs and integrating these tools more thoroughly into the curriculum could help bridge the proficiency gap. Additionally, the variability in usage calls for more personalized support to address individual student needs. Ensuring that students are well-versed in a broad range of IT tools is essential for enhancing the overall quality of research and research output for academic integrity (Smith, 2019).

Conclusion and Recommendations

This study has comprehensively examined the utilization of information technology (IT) tools by postgraduate students for research in Federal Universities within the North Central States of Nigeria. It has been established that the primary IT tools employed include data analysis software, research databases, and online libraries. These tools play crucial role in facilitating various aspects of research, such as data analysis, data collection, and literature review, underscoring their significant use among postgraduate students. The presence of adequate infrastructure and institutional support, in particular, plays a pivotal role in promoting the effective use of IT tools and the benefits of using IT tools are evident in the streamlined processes of literature retrieval, data presentation, and overall research efficiency.

Based on the findings provided, here are the recommendations for findings: the University Libraries and ICT unit should enhance the availability and accessibility of Reference Management Software, Collaboration and Communication Tools, Academic Writing Tools and Virtual Learning Environments across all federal universities to ensure that all postgraduate students have consistent access to these essential tools. Postgraduate Student should maintain the high usage levels of Reference Management Software, Collaboration and Communication Tools, Academic Writing Tools, and Virtual Learning Environments (VLEs) by ensuring continuous access, providing user support, and integrating these tools into research methodologies taught within the university programs.

References

Almarabeh, T., Mohammad, H., Yousef, R., & Majdalawi, Y. K. (2016). The University of Jordan students' perceptions of utilizing Blackboard. Journal of Software Engineering and Applications, 9(4), 176-189.

Borrego, Á., Anglada, L., & Abadal, E. (2020). Transformative agreements: Do they pave the way to open access? Learned Publishing, 34(1), 216-224.

Brown, E. F., Johnson, R. L., & Williams, M. P. (2020). Collaborative writing using word processing software: A case study of postgraduate research teams. *Journal of Collaborative research, 35(4), 212-227*.

Bruns, A., & Stieglitz, S. (2019). Towards more systematic Twitter analysis: metrics for tweeting activities. *International Journal of Communication*, 13, 528-547.

Chinomona, R. (2021). The use of data analysis tools in qualitative research: Can technology really help? Qualitative Market research: *An International Journal*, 24(2), 230-245.

De Wever, B., Hämäläinen, R., & Voet, M. (2020). Literature Review on the Use of Digital Tools

Dingsøyr, T., Nerur, S., Balijepally, V., & Moe, N. B. (2018). A decade of agile methodologies: Towards explaining agile software development. Journal of Systems and Software, 85(6), 1213-1221.

Garcia, S. K., & Martinez, J. R. (2017). The role of online communication platforms in postgraduate research collaboration. *Journal of Digital Education*, 18(1), 45-56.

Gatti, M., Guerini, M., & Turchi, M. (2021). Machine translation for academic writing: A case study. Natural Language Engineering, 27(3), 345-367.

Hyland, K. (2016). Academic publishing and the myth of linguistic injustice. Journal of Second Language Writing, 31, 58-69.

Jamali, H. R., & Nabavi, M. (2015). Open access and sources of full-text articles in Google Scholar in different subject fields. Scientometrics, 105(3), 1635-1651.

Joo, Y. J., Lim, K. Y., & Kim, E. K. (2017). Factors influencing nursing students' academic success: A structural equation modeling approach. *Nurse Education Today*, 53, 33-38.

Kimmons, R. (2017). Exploring digital literacy competences among internet users: Insights for developing 21st-century skills. *Journal of New Approaches in Educational research*, 6(1), 1-9.

Lowry, P. B., Curtis, A., & Lowry, M. R. (2017). Building a taxonomy and nomenclature of collaborative writing to improve interdisciplinary research and practice. Journal of Business Communication, 41(1), 66-99.

Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. Online Learning, 22(1), 205-222.

Pandita, R., Singh, S., & Sharma, P. (2020). Reference management tools: A comparative analysis. Library Hi Tech News, 37(4), 1-8.

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research methods for business students (8th ed.). Pearson.

Smith, C. D. (2019). Enhancing scholarly writing using reference management tools. *Journal of Postgraduate Studies, 12(2), 78-91*.

Wickham, H., & Grolemund, G. (2016). R for data science: Import, tidy, transform, visualize, and model data. O'Reilly Media.

APPLICATION OF PRESERVATION STRATEGIES IN MANAGING STUDENTS' ACADEMIC RECORDS IN THE FACULTY OF EDUCATION, AHMADU BELLO UNIVERSITY, ZARIA

USMAN, ABBA
Ahmadu Bello University, Zaria.

Abstract

This study examined the Application of Preservation Strategies in Managing Students' Academic Records in the Faculty of Education, Ahmadu Bello University, Zaria. Three (3) objectives were raised for the study, among which are; Identify the types of Students' Academic records that are being generated, identify the methods used in preserving students' academic records, and find out the challenges faced in managing students' academic records. A quantitative research methodology was employed, and a cross-sectional survey research design was used for the study. The population comprised of eighty-five (85) administrative, clerical staff and examination officers handling academic records within the eight (8) Departments, Deans Office, and the Central Academic Office, Main Campus, A.B.U, Zaria. A total enumerative sampling technique was adopted i.e., the entire population of 85 was used. An open-ended ended self-developed questionnaire was used to collect data from the respondents. Descriptive statistics (frequency distribution and percentages) were used to analyse the data collected from the respondents, and a benchmark of 50% and above was regarded positive and accepted, while items with less than 50% were regarded negative. The study revealed that Admission letters, Academic Transcripts, Progress Report, Statement of Result, Certificate of Result, Students files, Examination records, UG students projects, PG students Theses/Dissertations, Departmental journals, Transfers and Curriculum/Teaching records are the most common types of students' academic records being generated in the Faculty of Education, A.B.U., Zaria, digitization and electronic storage is the most common method of preservation of students' academic records, limited storage space, insufficient records management facilities, keeping up with changing technology, inadequate legal and regulatory frameworks, staff shortage or turnover, inconsistency of records management policies, ensuring compliance with regulations and standards and giving shortest time to the university/higher institution of learning for request are the most common challenges of managing students' academic records in the Faculty of Education, A.B.U., Zaria. The study concluded that while digitization is the primary strategy for preserving various types of students' academic records in the Faculty of Education, A.B.U., Zaria, challenges such as limited storage, inadequate facilities, technological changes, and staffing issues hinder effective records management. It was, therefore, recommended that to enhance efficiency, there is a need for implementing organizational systems that combine digital and physical strategies in their preservation system and to address all the challenges faced in managing academic records across the Faculty of Education, its Departments and the central academic office in Ahmadu Bello University, Zaria.

Keywords: Academic Records, Ahmadu Bello University, Application, Faculty of Education, Managing, Preservation, Records, Strategies, Students, University

Introduction

The management of students' academic records is a critical function in higher education institutions. These records such as admission letters, academic transcripts, statements of results, progress reports, certificates, examination records, student files, undergraduate projects, and postgraduate theses are fundamental for academic planning, decision-making, and future reference. In the Departments under the Faculty of Education, Ahmadu Bello University, Zaria, these documents support student progression, graduation, verification processes, and institutional accountability. Properly managing these academic records requires not only effective organization but also the application of appropriate preservation strategies to ensure their longevity and usability (Abdullahi, 2021; Abdulrahim & Agada, 2022). Academic records are diverse in nature and are generated through various stages of a student's academic lifecycle. These include but are not limited to admission documents, transcripts, progress reports, statement of results, and departmental teaching records. Other significant records such as postgraduate theses/dissertations, departmental journals, and transfer documentation also form an essential part of the academic records system. Proper classification and arrangement of these records are necessary for timely retrieval, smooth processing, and institutional efficiency (Ailakhu, 2021; Allison, 2021).

Preservation of these records is vital to prevent deterioration caused by environmental, biological, or technological factors. Common preservation methods employed include proper storage and handling techniques, climate control, digitization, the use of acid-free materials, and physical measures like configuring shelving to improve air circulation and avoid pest infestation. Additionally, regular site inspections and pest control interventions are employed to safeguard the records from physical damage (Usiedo et al., 2022; Ilo et al., 2020). However, despite the adoption of these methods, effective preservation of academic records still faces several constraints.

The challenges of managing students' academic records are multifaceted. These include difficulties in ensuring the accuracy and completeness of records, adapting to rapidly changing technology, securing privacy, and managing limited storage space. Other issues involve inadequate legal and regulatory frameworks, inconsistency in records management policies, and the shortage of trained records personnel. Moreover, institutions often face pressure to respond to record requests within very short timeframes, further highlighting the importance of a well-preserved and efficiently managed academic records system (Ejiroghene, 2020; Mubofu, Mambo & Samzugi, 2020). The findings are expected to enhance academic recordkeeping practices and inform policy decisions to improve preservation standards within Nigerian university settings. Previous studies have emphasized the evolution of preservation practices over time, highlighting the importance of comprehensive approaches to safeguarding historical artifacts and documents (Channell, 2020). Preservation activities aim to minimize physical and chemical deterioration of records through stable environments, safe handling methods, duplication of unstable materials, and proper storage in stable housings

Statement of the Problem

Students' academic records such as admission letters, transcripts, progress reports, examination records, and project reports should be systematically generated, well-organized, securely stored, and preserved using effective strategies that support long-term accessibility and institutional accountability (Usiedo et al., 2022). Best practices advocate for the adoption of

modern preservation methods including digitization, proper storage techniques, pest control, and climate regulation to ensure the safety and retrievability of these vital records (Mubofu, Mambo, & Samzugi, 2020).

However, the reality in many Nigerian universities, including the Faculty of Education at Ahmadu Bello University, Zaria, often falls short of these expectations. Students' academic records are frequently subjected to poor storage conditions, physical deterioration, uncoordinated record arrangement, and inadequate application of preservation methods. Compounding this issue are challenges such as limited funding, obsolete filing systems, staff shortages, and a lack of institutional commitment to comprehensive records management policies (Abdullahi, 2021; Allison, 2021).

This presents a significant gap in the literature. There is a need to explore how students' academic records are specifically generated, preserved, and managed within the academic departments of faculties particularly in the context of the Faculty of Education at Ahmadu Bello University, Zaria. Understanding the preservation strategies and the associated challenges at this level can offer deeper insights into institutional information management and propose targeted solutions for academic continuity and record integrity.

Objectives of the study

The following objectives guided the study:

1 To identify the types of Students' Academic Records being generated in the Departments of Faculty of Education, Ahmadu Bello University, Zaria
2 To determine the strategies being used in preserving students' records for processing of academic records in the Departments of Faculty of Education, Ahmadu Bello University, Zaria
3 To identify the challenges of managing students' records for processing of academic records in the Departments of Faculty of Education, Ahmadu Bello University, Zaria.

Literature Review

Universities, in the course of fulfilling their core mandates of teaching, learning, research, and community service, generate a wide range of records that document academic and administrative activities. These records serve as evidence of institutional operations and the academic progress of students. They are critical for decision-making, continuity, and compliance with statutory requirements (Shehu, 2020).

The academic records created during a student's lifecycle are central to both the student's progress and the university's accountability. These records begin from the point of admission and may extend long after graduation. According to c universities generate and manage various categories of documents including correspondence, personnel files, examination records, minutes of meetings, student admission records, and transcripts. Each of these records reflects different stages of the student's academic journey and institutional engagement.

A primary academic document is the admission letter, which marks the official entry of a student into the institution. This is followed by the creation of student files that typically contain

personal and academic data, and are used for tracking student progression throughout their stay in the institution. Academic transcripts, statements of results, and certificates of results are generated to document and communicate students' performance. Transcripts are comprehensive records of all courses taken and grades earned, while statements and certificates provide summaries for certification or employment purposes. Progress reports are often used within semesters or academic sessions to monitor a student's academic standing. Examination records, which include marked scripts, results sheets, and grading documents, form a critical part of this data and must be securely preserved for reference and quality assurance. At the undergraduate and postgraduate levels, students' projects, theses, and dissertations are key research outputs that contribute not only to the student's academic credentials but also to the university's research profile. These are typically archived by departments or university libraries.

In addition, departmental journals, though not strictly personal academic records, are sometimes included in academic documentation as they reflect the intellectual environment and scholarly engagement within departments. Other types of records include transfer documents for students changing departments or institutions, and curriculum/teaching records such as course outlines, lecture timetables, and grading schemes, which support instruction and student assessment.

Effective management of these academic records requires structured systems and policies to ensure that records are generated, used, and preserved appropriately. Shehu (2020) emphasizes that even after graduation, the student-university relationship continues, as alumni often return to request various academic documents for further studies, job applications, or professional certifications. In essence, managing these records effectively is not only vital for the smooth operation of academic institutions but also for preserving institutional memory and protecting the rights of students. Without proper handling, valuable data can be lost, leading to administrative difficulties and potential legal consequences.

Preserving academic records is a crucial responsibility of educational institutions, as these records serve as evidence of students' academic achievements, institutional activities, and administrative processes. Proper preservation ensures the authenticity, reliability, and accessibility of such records for future reference, accountability, and compliance with regulatory requirements (Usiedo, Kalu, Nworie & Ibeh, 2022). Several studies have examined preservation and conservation practices in libraries (Usiedo et al., 2022; Ilo et al., 2020) and disaster preparedness for safeguarding library materials (Ejiroghene, 2020). Others, like Abdulrahim and Agada (2022), have focused on records arrangement and finding aids for academic retrieval, while Ailakhu (2021) and Allison (2021) explored general records management practices in registry units of academic institutions. Although these studies provide valuable insights into preservation and recordkeeping, they have largely concentrated on either library materials or registry-based administrative records, with limited attention given to departmental-level management of students' academic records in faculties such as Education.

Academic records—such as admission letters, transcripts, progress reports, and certificates are vulnerable to physical, environmental, and biological threats. Therefore, institutions must adopt a variety of strategies and best practices to ensure their long-term preservation. One of the

most basic and essential preservation strategies is the use of proper storage and handling techniques. Records should be stored in labeled, organized systems, with minimal handling to avoid physical wear and tear. This includes using clean hands or gloves, avoiding food and drinks near records, and keeping the storage environment dust-free (Mubofu, Mambo & Samzugi, 2020).

To further protect against environmental damage, climate control and monitoring are necessary. High temperature and humidity levels can accelerate the deterioration of paper-based records and foster the growth of mold. The recommended climate for record storage is a stable temperature between 18–22°C and relative humidity between 30–50% (Ilo, Nkiko, Izuagbe & Furfuri, 2020). Regular monitoring systems should be in place to detect fluctuations. With the rise of digital technologies, many institutions now employ digitization and electronic storage to back up physical records. Digitization not only reduces handling of fragile originals but also ensures easier retrieval and off-site access in case of emergencies or disasters. However, digital preservation requires periodic migration of data and proper metadata for retrieval (Ejiroghene, 2020). Acid-free materials are also commonly used in the physical preservation of records. Acidic paper can degrade over time, so storing documents in acid-free folders, envelopes, or boxes helps prevent chemical deterioration (Usiedo et al., 2022).

Attention must also be given to the design of storage facilities. For instance, carefully selecting furnishing materials and floor coverings that do not attract insects or emit harmful gases can greatly reduce the risk of pest infestation and chemical exposure. Similarly, configuring shelving such that the bottom shelf is positioned 100–150 cm from the floor allows for better air circulation and ease of cleaning (Abdullahi, 2021). Biological threats such as insects and rodents can cause irreparable damage to records. Therefore, regular inspection of storage sites for pests and vermin is necessary. This should be coupled with the use of pest control traps and baits, especially in areas prone to infestations (Mubofu et al., 2020). Therefore, a comprehensive preservation strategy combines physical, environmental, and technological measures. Institutions must invest in modern storage facilities, staff training, and digital infrastructure to maintain the integrity and accessibility of academic records across generations.

Managing students' academic records is a vital function of educational institutions. These records provide evidence of student admission, progress, achievements, and certifications. However, ensuring the effective management of these records is fraught with several challenges, particularly in Nigerian universities and other developing contexts (Abdullahi, 2021).

One of the major challenges is ensuring the accuracy and completeness of records. Records must be precise and up to date to reflect students' academic status and facilitate timely decision-making. However, inconsistencies or omissions in record entries—often due to manual processes or lack of training can result in administrative errors and delays (Ailakhu, 2021). In today's digital age, keeping up with changing technology poses another critical challenge. The shift from traditional paper-based systems to digital records management requires new infrastructure, staff re-skilling, and funding. Many institutions struggle to acquire up-to-date software, manage data migration, or adapt to emerging information systems (Ejiroghene, 2020; Mubofu, Mambo & Samzugi, 2020). Another sensitive issue is ensuring privacy and security of records. Academic records contain confidential student data and must be protected from unauthorized access, loss, or

cyber-attacks. Unfortunately, many institutions operate without robust data protection policies or security protocols, increasing the risk of data breaches (Ilo, Nkiko, Izuagbe & Furfuri, 2020).

An inadequate legal and regulatory framework further complicates records management. While national guidelines exist, many universities lack internal policies that clearly outline the lifecycle, retention, and disposal of academic records. This leads to inconsistency in practice and accountability gaps (Usiedo, Kalu, Nworie & Ibeh, 2022). The limited storage space challenge is particularly prominent in faculties and departments where physical records dominate. Without proper shelving, archiving solutions, or space allocation, records may become cluttered, misplaced, or damaged (Abdulrahim & Agada, 2022). Moreover, institutions face pressure in ensuring compliance with regulations and standards such as those from regulatory bodies like the National Universities Commission (NUC). Failing to meet documentation or audit requirements can affect institutional credibility and accreditation (Allison, 2021).

Insufficient records management facilities, including lack of filing cabinets, secure storage rooms, and digital infrastructure, hinder proper organization and preservation of academic documents. In many cases, faculty offices rely on outdated methods that expose records to damage or loss (Abdullahi, 2021). In some universities, there is inconsistency in records management policies, leading to variation in practices across departments. Without standardized procedures, maintaining uniformity in documentation, retrieval, and storage becomes challenging (Ailakhu, 2021). Staffing shortages or high turnover rates also disrupt the continuity of records management practices. When experienced staff retire or leave without proper handover or training of new personnel, institutional memory is lost, and errors may increase (Allison, 2021). Therefore, the management of students' academic records in Nigerian universities is hindered by both systemic and infrastructural challenges. Addressing these issues requires a comprehensive strategy involving policy development, staff training, digitization, and adequate funding to ensure the reliability, accessibility, and security of academic records.

Methodology

The research adopted the quantitative approach and cross-sectional survey research design. The population consist of all the Administrative Officers, Clerical Officers, Examination Officers and their Assistants in the Departments, Deans' office of the Faculty of education and the central academic office of Ahmadu Bello University, Zaria, and totaling 85. Self- self-developed questionnaire was used as the instrument for data collection. Eighty-five copies of the questionnaire were administered to respondents, and eighty were retrieved with complete information, making a percentage response rate of 94.1% used for the study. Analysis of the collected data involves utilizing frequency distribution and percentages. A benchmark of 50% and above was regarded positive and accepted, while items with less than 50% was regarded negative.

Result and discussions

Types of Academic Records Generated in Departments, Dean's office, Faculty of Education and the Central academic office of Ahmadu Bello University, Zaria

In order to determine the types of academic records generated in Departments, Dean's office, Faculty of Education and the Central academic office of Ahmadu Bello University, Zaria,

a list of type of academic records generated or created was provided for them to select which is or are applicable to them.

Table 1: Types of Academic Records Generated in Departments, Dean's office, Faculty of Education and the Central Academic Office of Ahmadu Bello University, Zaria

S/No	Type of Academic records	Frequency (F) & Percentage (%)
1.	Admission letters	72(90.0)
2.	Academic Transcripts	64(80.0)
3.	Progress Report	66(82.5)
4.	Statement of Result	68(85.0)
5.	Certificate of Result	58(72.5)
6.	Students files	69(86.3)
7.	Examination records	72(90.0)
8.	UG students projects	70(87.5)
9.	PG students Theses/Dissertations	70(87.5)
10.	Departmental journals	50(62.5)
11.	Transfers	62(62.5)
12.	Curriculum/Teaching records	55(68.8)

Source: field survey, 2025

Table 1 presented the types of academic records generated within the Departments, Dean's office, Faculty of Education and Central academic office of Ahmadu Bello University, Zaria. The result shows Admission letters and Examination records has the frequency and percentage of 72 (90.0%) each. This is followed by Undergraduate projects and Postgraduate students Thesis/Dissertations each contributing 70 (87.5%). While, student files has 69 (86.3%). This is followed by students result with 68 (85.0%). The analysis shows that Progress Reports holds 66 (82.5%) of the total population, this is followed by academic transcripts with 64 (80.0%), followed by transfers with 62 (77.5%) of the total population, then Curriculum/Teaching records has 55 (68.8%), and finally Departmental Journals with 50 (62.5%).

It can be inferred from Table 1 that, Admission letters, Academic Transcripts, Progress Report, Statement of Result, Certificate of Result, Students files, Examination records, UG students projects, PG students Theses/Dissertations, Departmental journals, Transfers and Curriculum/Teaching records were the academic records that are above the stated benchmark of 50%. This indicates that all the records were on the positive side. This means that they are all significantly important records generated in the department and units of the faculty and central academic office of the university studied.

The high response rates for academic records such as Admission letters, Academic Transcripts, Progress Report, Statement of Result, Certificate of Result, Students files, Examination records, UG students projects, PG students Theses/Dissertations, Departmental journals, Transfers, and Curriculum/Teaching records in the present study align with Abdulrahman's (2015) findings. Abdulrahman highlighted the generation and utilization of these specific academic records within university departments and units, emphasizing their crucial role in various academic purposes.

This implied that the enduring importance and widespread use of these records across academic institutions, reinforcing the need for proper attention and efficient management to fulfil the objectives of the institution. The alignment of the present study strengthens the understanding of the significance of these specific academic records in managing students' academic records supporting university operations and underscores their relevance in achieving educational goals and objectives.

Table 2: Methods used in Preserving Students' Academic Records in Departments, Dean's office, Faculty of Education and the Central academic Office of Ahmadu Bello University, Zaria

S/No	Method	Frequency (F) & Percentage (%)
1.	Proper storage and handling techniques	37(46.3)
2.	Climate control and monitoring	30(37.5)
3.	Digitization and electronic storage	65(81.3)
4.	Use of acid-free materials	20(25.0)
5.	Carefully selecting furnishing materials and floor coverings to exclude those that attract insects	15(18.8)
6.	Configuring the shelving so that the bottom shelf is 100- 150cm from the floor to enable cleaning and air circulation	25(31.3)
7.	Regularly inspecting the site for pest and vermin	30(37.5)
8.	Using pest control traps and baits	35(43.8)

Source: field survey, 2025

Table 2 presented the methods employed in preserving students' academic records within the Departments, Deans' office, Faculty of Education and the central academic office of Ahmadu Bello University, Zaria. The result highlights several strategies utilized for record preservation. Digitization and electronic storage has a frequency and percentage of 65 (81.3%), this is followed by proper storage and handling techniques which has 37 (46.3%) of the total population, followed by Using of pest control traps and baits which has 35 (43.8%), next is Climate control and monitoring and use of regularly inspecting of the site for pest and vermin were each has 30 (37.5%), subsequently, configuring the shelving so that the bottom shelf is 100- 150cm from the floor to enable cleaning and air circulation are also employed which has 25 (31.3%), this is followed by the use of acid-free materials which has 20 (25.0%), and finally, carefully selecting furnishing materials and floor coverings to exclude those that attract insects.

From table 2, it can be seen that the use of digitization and electronic storage is above the stated benchmark of 50%. This indicates it is on the positive side. i.e. it is the most common method of preservation being used in preserving academic records in faculty of education, its departments and the central academic office of Ahmadu bello university, Zaria. Although, there are still some of the academic records such examination result which are still in hard copy (Non digital) that are yet to be digitize, which are key part of the important academic records in the university.), while,

Configuring the shelving so that the bottom shelf is 100- 150cm from the floor to enable cleaning and air circulation have the least response rate. This finding correlate with studies stressing the importance of a holistic approach to records preservation, combining digital and physical strategies to ensure comprehensive protection against various risks (Omogbhemhe and Akpojaro (2018).

This implies that the dominance of digitization and electronic storage as the most common method of preservation, as indicated by the positive, suggests a prevalent trend toward leveraging digital technologies for safeguarding academic records. This aligns with the findings of several studies emphasizing the benefits and efficiency of electronic records management systems (Swarmy, and Parmar, 2020). However, the acknowledgement that some academic records, such as examination results, remain in hard copy format underscores the transitional phase in adopting fully digital preservation practices. The low response rate for practices such as carefully selecting furnishing materials, using acid-free materials, climate control, pest control, and proper storage and handling techniques in preservation books suggests potential gaps in the attention given to physical preservation measures.

Challenges of Managing Students' Academic Records in Departments, Dean's office, Faculty of Education and the Central academic Office of Ahmadu Bello University, Zaria

In order to find out the challenges of managing students' academic records in Departments, Dean's office, Faculty of Education and the Central academic office of Ahmadu Bello University, Zaria, a list of possible challenges in managing student academic records in universities or institutions of higher learning is provided to them to select which is or are applicable to them. Table 3 presented the data collected and analysed for this purpose.

Table 3: Challenges of Managing Students' Academic Records in Departments, Dean's office, Faculty of Education and the Central academic office of Ahmadu Bello University, Zaria

S/No	Challenge	Frequency (F) & Percentage (%)
1.	Ensuring the accuracy and completeness of records	35(43.8)
2.	Keeping up with changing technology	66(82.5)
3.	Ensuring privacy and security of records	35(43.8)
4.	Inadequate legal and regulatory framework	65(81.3)
5.	Limited storage space	75(93.8)
6.	Ensuring compliance with regulations and standards	50(62.5)
7.	Insufficient Records Management facilities	70(87.5)
8.	Inconsistency of records management policies	50(62.5)
9.	Staffing shortages or turnover	60(75.0)
10.	Gisving shortest time to the University/Higher Institution of Learning for Request	50(62.5)

Source: field survey, 2025

Table 3 presented the challenges faced in managing students' academic records within the Departments, dean's office, Faculty of Education and the Central academic office of Ahmadu Bello University, Zaria. The result shows that limited storage space has frequency and percentage of 75 (93.8%), followed by insufficient records management facilities which has 70 (87.5%), followed by Keeping up with changing technology has 66 (82.5%), followed by inadequate legal and regulatory frameworks which has 65 (81.3%), this is followed by staff shortage or turnover which has 60 (75.0%), next is Inconsistency of records management policies, ensuring compliance with regulations and standards and giving shortest time to the University/Higher Institution of Learning for Request with each having 50 (62.5%), followed by Ensurance of accuracy and completeness of records which has 35 (43.8%) of the total population.

From table 3, it can be seen that Limited storage space, insufficient records management facilities, Keeping up with changing technology, inadequate legal and regulatory frameworks, staff shortage or turnover, Inconsistency of records management policies, ensuring compliance with regulations and standards and giving shortest time to the University/Higher Institution of Learning for Request are the major challenges faced in managing students' academic records in faculty of education, its departments and the central academic office of Ahmadu Bello University, Zaria which are above the stated bench mark of 50%, while Ensurance of accuracy and completeness of records has the least response rate.

The identification of limited storage space, insufficient records management facilities, keeping up with changing technology, inadequate legal and regulatory frameworks, staff shortage or turnover, inconsistency of records management policies, and the pressure to respond quickly to requests as the most pressing challenges. This implied that there is a predominant concern for resource-related and regulatory issues rather than the content integrity of records.

This finding contrasts with Barde's (2019) who identified inadequate financial support and unskilled human resources as the major challenges in managing academic records at Ahmadu Bello University, Zaria. The divergence highlights the multifaceted nature of challenges in records management, indicating that institutions may face a variety of obstacles influenced by contextual factors such as resources, technology, and regulatory frameworks. The results emphasize the need for a comprehensive approach that considers diverse challenges to enhance the effectiveness of records management in higher education institutions.

Conclusion

It was concluded that the application of preservation strategies in managing students' academic records in the Faculty of Education, Ahmadu Bello University, Zaria, is commendable but still faces significant limitations. The adoption of digitization and electronic storage as the most common preservation method demonstrates a positive step toward modern and efficient records management. However, the presence of multiple challenges such as limited storage space, inadequate facilities, insufficient legal frameworks, technological gaps, and staffing issues suggests that while the strategies in place are good in principle, their implementation is hindered by infrastructural and administrative constraints. Therefore, although the preservation strategies being applied are generally good, their effectiveness is compromised by existing challenges,

indicating a need for policy improvement, investment in infrastructure, and capacity building to achieve optimal records management outcomes.

Recommendations

The following recommendations were made in line with the findings of the study:

1. Ahmadu Bello University's management should set up a digital platform, potentially using cloud computing, to manage students' academic records efficiency and consistency. They should also enforce a policy mandating the submission of departmental publications to the university's digital repository to enhance accessibility and knowledge sharing.
2. The management Ahmadu Bello University, Zaria, should provide a means of adopting proper storage and handling techniques (like the use of trolleys, acid free boxes, gloves), climate control, acid-free materials, and pest control measures to ensure comprehensive and effective preservation of academic records.
3. The management Ahmadu Bello University, Zaria, should prioritize the expansion of storage space to accommodate the growing volume of records, putting more continuous efforts to stay abreast of evolving technologies, ensuring that the record management system remains up-to-date and efficient, establish a robust legal and regulatory framework to guide record management practices, Mitigate staff shortages or turnover through training and recruitment, ensuring compliance with regulations and standards, harmonizing records management policies, and streamlining the request process.

References

Abdullahi, A. Y. (2021). Management of Students' Records in Academic Departments of Hassan Usman Katsina Polytechnic, Katsina, Nigeria. S. Musa Abdullahi Central Library, Hassan Usman Katsina Polytechnic, Katsina, Nigeria.

Abdulrahim, A. & Agada, A. (2022). Assessment of Records Arrangement and Utilization of Finding Aids for Information Retrieval in Faculty of Education, Ahmadu Bello University, Zaria. Samaru Journal of Information Studies, 22(1).

Ailakhu, U. (2021). Records Management Effectiveness in Registries of Open and Distance Learning Institutions. Madonna Journal of Research in Library and Information Science, 4(3), 68–86.

Allison, G. O. (2021). Records Management Practices and Job Performance of Registry Staff of Universities in Ogun State, Nigeria. International Journal of Academic Management Science Research (IJAMSR), 5(9), 69–78.

Abdulrahman, A. B. (2015). "Management of university records for effective administration of universities in north- central Nigeria". *International Journal of Library and Information Science*, 7(30), pp. 47- 54. Retrieved from Ahttp://www.academicjournals.org/IJLIS (12 October 2018).

Barde, M. A., Baba Aduku, S., & Daudu, H. M. (2019). Organization and retrieval of students' academic records in Ahmadu Bello University, Zaria. *Samaru Journal of Information Studies, 19* (1), 1-12.

Ejiroghene, E. R. (2020). Preservation and Conservation of Library Materials in the Digital Age: Challenges for Libraries in Nigeria. Library Philosophy & Practice.

Ilo, P. I., Nkiko, C., Izuagbe, R., & Furfuri, I. M. (2020). Librarians' Perception of Disaster Preparedness as Precursor for Effective Preservation and Conservation of Library Resources in Nigerian University Libraries. International Journal of Disaster Risk Reduction, 43, 101381.

Mubofu, C., Mambo, H., & Samzugi, A. (2020). Academic Libraries and Information Resources Preservation Strategies: Past, Present and the Way Forward.

Omogbhemhe, M & Akpojaro, J (2018). Development of Centralized Transcript Processing System. Adegboyega University, Ogwa, Edo State, Nigeria. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS).* 235-243. https://www.researchgate.net/publication/337256757 Online

Shehu, U. M. (2020). Implications of poor management of students' academic records in Nigerian universities. *Information Impact: Journal of Information and Knowledge Management, 11(3), 31-40.* doi: dx.doi.org/10.4314/iijikm.v11i3.4

Swamy, J. M., & Parmar, K. (2020). Secure and decentralized academic transcript system based on blockchain technology. In H. Vasudevan, A. Michalas, N. Shekokar, & M. Narvekar (Eds.), Advanced Computing Technologies and Applications. Algorithms for Intelligent Systems. Springer.

Usiedo, B. A., Kalu, C. O., Nworie, J. C., & Ibeh, O. B. (2022). Preservation and Conservation of Library Resources in Nigerian Libraries: A Review. Communicate: Journal of Library and Information Science, 24(2).

AWARENESS AND ACCESSIBILITY OF ELECTRONIC DATABASE BY USERS OF SELECTED UNIVERSITY LIBRARIES IN NORTH-EAST ZONE, NIGERIA

Regina Enajite Brisibe
University of Maiduguri.

Hilari Edward
University of Maiduguri.

Gideon Chongmob Manzo
University of Maiduguri.

Abstract

This study investigated the Awareness and Accessibility of Electronic databases by Users of University Libraries in North-East Zone, Nigeria. The study is guided by two research questions, which examined the level of awareness and accessibility of online databases as well as extent of accessibility to the electronic databases. The study adopted quantitative methodology with survey as the research design. The study covered two (2) Universities located in North East Zone, Nigeria. The respondent groups were library users. The research design used is survey method. Stratified Proportionate sampling technique is used in selecting the respondents. Questionnaire was used as research instrument which was pretested with a reliability value of r=0.79. The instrument was administered by the researcher and research assistants to the respondents. Frequency counts and percentage scores are used to analyze data presented in tables and histogram. Findings revealed that there was low level of awareness, inefficient accessibility to the electronic databases. The study therefore recommended among others that much emphasis should be given to creating awareness among users and also effort should be put towards ensuring that users can easily gain access to the electronic databases.

Keyword: Electronic, Database, Awareness, Accessibility, Users, North-East Zone, Nigeria, University Libraries.

Introduction

It is an undeniable fact that the use of Information Communication Technologies has brought tremendous changes in the way information is generated and stored. Technological advances and innovations have changed the operations of organizations and institutions including libraries of all types. For instance, the Medical Literature Analysis and Retrieval System Online(Medline), Health InterNetwork Access to Research Initiative (HINARI), EBSCOHOST, and ScienceDirect amongst others.

Electronic databases have become a major element of library collections around the globe. They are regarded as essential for learning, teaching and research activities (Larson, 2017). Samaravickrama and Samaradiwakara (2014) opine that their impact on academic libraries and scholars is noteworthy and unprecedented. These databases are organized digital collections of published literature such as journal articles, newspaper articles, conference proceedings, reports, theses, e-books among others.

Awareness and use of electronic resources is very important so as to keep users alert of the available electronic databases through which they can access needed information resources (Akinola, Shorunke, Ajayi, Odefadehan and Ibikunle, 2018). Akpojotor (2016) also reiterated that awareness is core to the usage of electronic information resources; where materials are in closed access, users' ease of access to such e-resources is by far reduced, but where they are in open access (not subscription-based), users find and use them. Abdulganiyu, Mshelia and Aliyu, (2019) opined that students' level of access, usage and awareness of electronic information resources at the Ramat Library, University of Maiduguri is not high and that the major problem, however, identified in their study, is lack of information retrieval skills for exploiting electronic resources, thus making the level of usage of resources by students very low.

Accessibility of electronic information resources as the process of making scientific information readily available and reachable for a particular researcher while utilization of the resources constitutes the process that enables researchers to effectively and efficiently access the soft copy, electronic or digital information for an increase in the quality and effectiveness of their research activities. There are advantages of these databases when it is compared to print, they include among others; strong sharing ability, great potential for collection expansion, large information capacity and less storage space. In addition, one does not need to go to the library as they can be made available to users anywhere and at any time.

Statement of Problem

Electronic databases are widely available and can be accessed from anywhere and by many users at the same time. It is therefore convenient to use. University libraries, therefore, spend large amount of money on these resources to satisfy the teaching, learning and research needs of its students and staff. As universities spend substantial amount of money on subscription of these databases, it is only appropriate and economical that these databases are optimally utilized to contribute to the academic achievement of students and staff and also to get value for the money. Preliminary observation by the researcher revealed that the majority of the users are not aware that the universities subscribed to electronic databases. There was no awareness let alone accessibility of these databases and the few library users that access them do not know their uses.

Nevertheless, it is one thing for an academic library to acquire and automate its services, it is another for the users to be sufficiently informed of the existence of these electronic databases and have easy access to them and effectively use of them for their information needs. The absence of awareness, accessibility and proper utilization of electronic databases in this information technology age may very well result in intellectual, and possibly, economic poverty. Those that are not aware of the existence of these library resources have created a shortage and underutilization of the subscribed databases.

Research Questions

The following research questions were answered.

1. What is the level of user awareness about the online e-database in the university libraries in northeast Nigeria?

2. To what extent the provision made by the university libraries aid users access e-database in northeast Nigeria?

Literature Review

Many studies have been undertaken on electronic databases in the areas of awareness, usage, relevance, access, preference, orientations and training, and evaluation among others. It is found in the literature that there are sometimes a gap between awareness and usage of digital resources. Either users are aware of the resources and use them, users are aware and do not use them, or users are unaware of them and therefore do not use them (Nisha and Ali, 2013).

A study on awareness and use of electronic databases by postgraduates in the University of Ibadan by Akinola, Shorunke, Ajayi, Odefadehan and Ibikunle (2018), found out that majority of the postgraduate students of the University of Ibadan are generally aware of electronic databases under consideration. However, most of them are not aware of the individual electronic databases that are made available by the university library for postgraduate students' use. Results from the analysis showed that the frequency of use of the electronic database by postgraduate students is low. Study by Mohammed and Kannan (2021) on Awareness, Availability and Utilization of Databases among Undergraduate Students, also revealed that the vast majority of the participants used Internet search engines rather than specialized databases and full-text resources. The study associated the main problem with the non-use of resources are lack of adequate searching skills and awareness. Onyeneke (2019) investigated Awareness and Use of E-Resources in Federal University of Technology Owerri (FUTO) By Staff and Students. The study found out that in spite of the high level of acceptance and use of e-resources in the University library, some challenges still pose a clog in the wheel of progress in terms of effective access and use of e-resources in the University library.

Access is a general term used to describe the degree to which a resource, service, product, environment is accessible by as many people as possible. It can be viewed as the ability to access information with little or no stress. The more accessible information resources are, the more likely they are to be used. Readers tend to use information resources that require the least effort to access. Abbas and Song (2020) investigated the level of accessibility and utilization of electronic information resources in Agricultural Research Institutes in Kaduna state. The study showed high extent level of accessibility of electronic information resources in the institutes. While responses showed high extent utilization of electronic information resources. The study concluded that there is high level of accessibility to online information resources and high extent rate of utilization of the resources for research activities in Agricultural Research Institutes in Kaduna state.

In a similar related study conducted by Aina (2014) on "Awareness, Accessibility and use of Electronic Databases among Academic staff of Babcock University Business School", a population of One hundred and eighteen academic staff in Backcock Business School was used, Questionnaire was the instrument used for data collection, the data collected were analyzed by Statistical Package for Social Sciences (SPSS), Survey research design was adopted for the study. Simple random technique was adopted for the study. The result of the study revealed that only 40 (47.1%) and above of respondents had full accessibility to Academic Journal, Ebscohost and JSTOR databases. AJOR (30: 35.3%), Electronic Resources for Research Methods (36: 42.4%), and International Research Journal (38: 44.7%) were averagely accessible to the respondents

respectively. It was also revealed that the following databases were not accessible to respondents with Bookboon (19: 22.4%), Dissertation and Theses (19: 22.4%), DOAJ (55: 64.7%), HINARI (20: 23.5%), SAGE (23:27.1%), World Bank Open Knowledge Repository (31: 36.5%) and National Virtual Library Databases (25: 29.4%). This implies that despite the fact that these resources were subscribed to and respondents were aware of them still they are not all fully accessible due to one challenge or the other such as inadequate internet facility and electricity supply.

Methodology

The study adopted quantitative methodology with survey as the research design. The study covered two (2) Universities located in North East Zone, Nigeria. The respondent groups were library users. Four hundred and twenty three (423) was drawn using stratified proportionate sampling technique from the target population of 4,234. Stratified Proportionate sampling technique is used in selecting the respondents. Questionnaire was used as research instrument which was pretested with a reliability value of r=0.79. The instrument was administered by the researcher and research assistants to the respondents. Frequency counts and percentage scores are used to analyze data presented in tables and histogram.

Analysis and Discussion

Research Question 1: What is the level of user's awareness about the online e-database in the university libraries in Northeast Nigeria?

Table1: Level of Awareness of electronic databases by users N=364

S/N	Subscribed Electronic Databases	FA	AA	SA	NA
1	Elsevier Science Direct	10 (2.7%)	50 (13.7%)	104 (28.6%)	200 (54.9%)
2.	HINARI	200 (54.9%)	114 (31.3%)	10 (2.7%)	40 (11%)
3.	Open Access Journals	50 (13.7%)	10 (2.7%)	200 (54.9%)	104 (28.6%)
4.	JSTOR	20 (5.5%)	40 (11%)	104 (28.6%)	200 (54.9%)
5.	Open Educational Resources (OERs)	30 (8.2%)	40(11%)	200 (54.9%)	94 (25.8%)
6.	Law Pavillion	20 (5.5%)	40 (11%)	200 (54.9%)	104 (28.6%)
7.	ProQuest	60 (16.5%)	50 (13.7%)	70 (19.2%)	184 (50.5%)
	Average	56(15.3%)	49(13.5%)	127(27%)	132(36.3%)

Source: Field Survey, 2025

Key: FA: Fully Aware; AA**:** Averagely Aware; **SA:** Scarcely Aware; **NA:** Not Aware

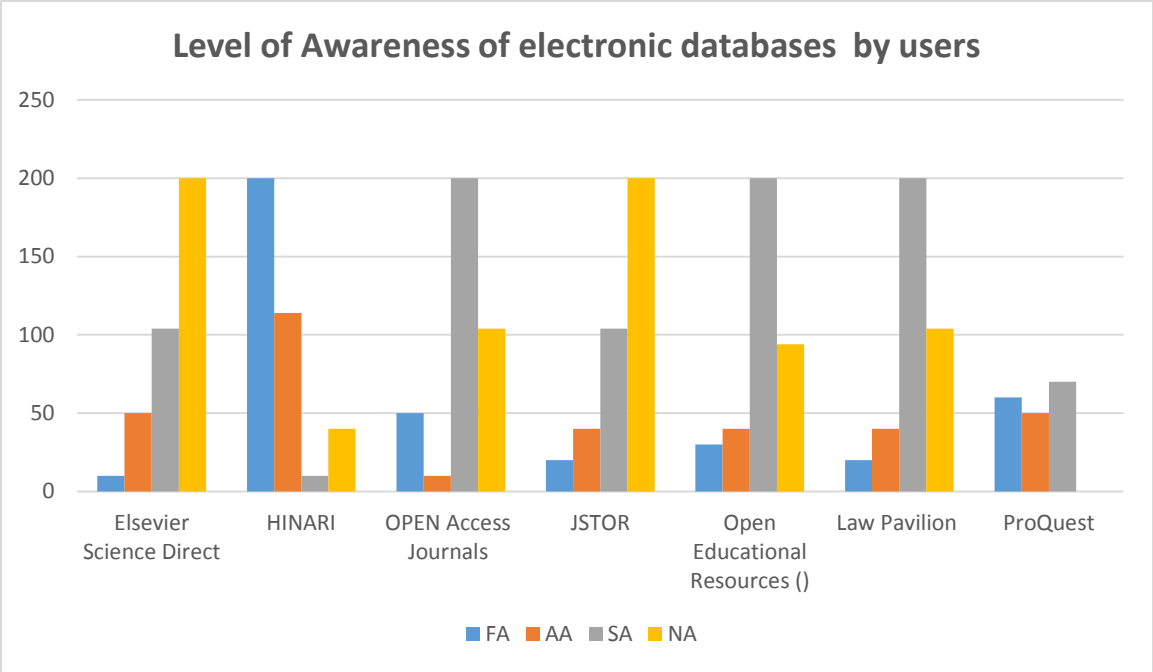


Figure 1: graphical representation of response from the respondents

Table 1 and figure1 represents the level of user awareness of Electronic Databases available in the university libraries. From the analysis on the table, it was revealed that majority of the respondents indicated that they are not aware of the available e- databases. From the analysis, 56(15.4%) responses rated "Fully Aware", 49 (13.4%) responses rated "Averagely Aware" and 127 (35%) responses rated "Scarcely Aware" while 132 (36.2%) responses rated "Not Aware". This shows that there is low level of awareness of e-databases in the institutes.

The finding on the level of users' awareness of the e-databases shows that majority of the users are scarcely and not aware of the databases subscribed to by the institutions. This finding is in agreement with the work of Ahmed (2013) who indicated that students used free electronic resources more than university subscribed resources because of lack of awareness. The study is also in support with that of Mohammed and Kannan (2021) on Awareness, Availability and Utilization of Databases among Undergraduate Students, which revealed that the vast majority of the participants used Internet search engines rather than specialized databases and full-text resources. The study therefore associated the main problem with the non-use of resources as lack of adequate searching skills and awareness. While the finding is in contrast with the study of Nisha and Ali, (2013) who found that clients were aware of and used the e-databases available to them.

Research Question 2: to what extent the provision made by the university libraries aid users access to e-database in Northeast Nigeria?

Table 3: Extent of Access to electronic databases by the users N=364

Source: Field Survey, 2021

S/N	Statements	HE	ME	LE	VLE
1	Library provides easy on-campus access to electronic	14 (3.8%)	70 (19.2%)	104 (28.6%)	176 (48.4%)

	resources on the subscribed databases				
2.	Library provide literacy training programme on the enlightenment and use of the databases	20 (5.5%)	50 (13.7%)	94 (25.8%)	200 (54.9%)
3.	Library provides remote access to electronic resources on the subscribed databases	40 (11%)	66 (18.1%)	84 (23.1%)	174 (47.8%)
4.	It is 1asy to navigate through the library website and the databases	200 (54.9%)	104 (28.6%)	50 (13.7%)	10 (2.7%)
5.	e-library staff are always ready to provide professional guidance to users	204 (56%)	100 (27.5%)	50 (13.7%)	10 (2.7%)
6.	Library electronic database links are always active	10 (2.7%)	50 (13.7%)	104 (28.6%)	200 (54.9%)
7.	library provides adequate number of e-journal titles	10 (2.7%)	50 (13.7%)	103 (28.3%)	201(55.2%)
	Average	71(19.5%)	70(19.2%)	84(23.1%)	139(38.1%)

Key: **HE:** High Extent; **ME:** Moderate Extent; **LE:** Low Extent; **VLE:** Very Low Extent

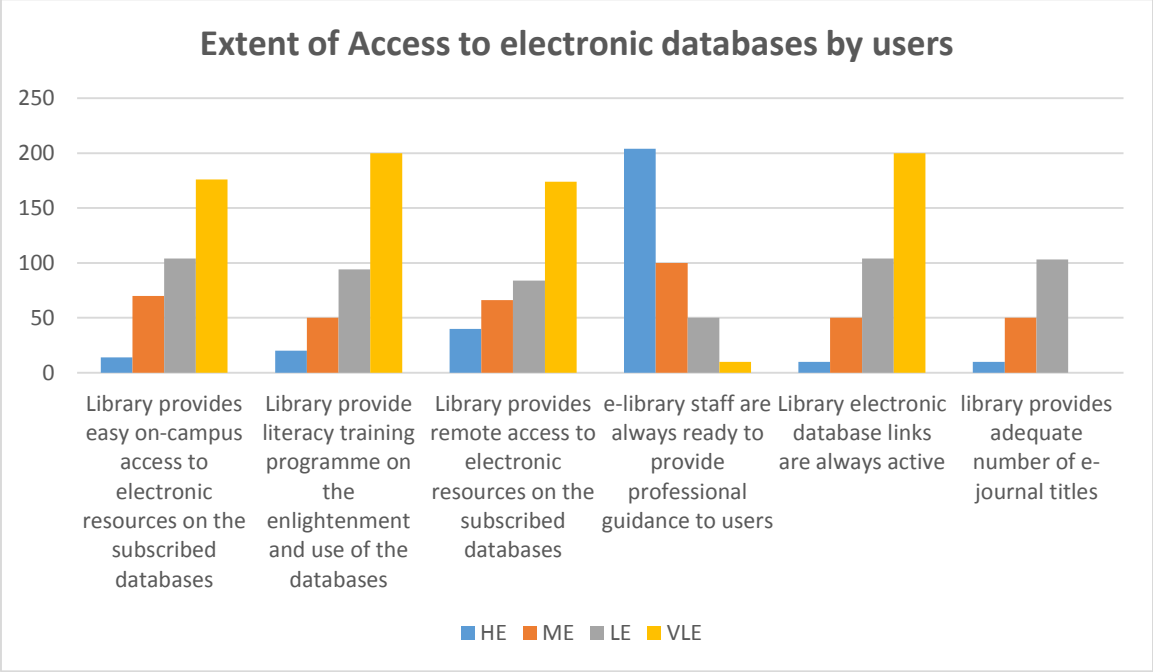


Figure 2: **Graphical representation of response from the respondents**

Table 3 and figure 2 represents the extent of accessibility to the e- databases. From the analysis on the table, it was revealed that the respondents indicated that library does not provide access to electronic resources on the e-databases. The descriptive analysis of the extent of accessibility of e-databases revealed that out of the 423 valid copies of questionnaire analyzed, they generated a total of three hundred and four (364) responses where 71 (19.5%) responses were rated "High Extent",

70(19.2%) responses rated "Moderate Extent", and 84(23.1%) responses rated "Low Extent" while 139(38.1%) responses rated "Very low Extent" This implies that level of accessibility to the e-databases is to a low extent.

The findings on the extent of accessibility to the e-databases revealed low level of accessibility to the e-databases. This finding corroborated the studies of Song and Song (2017) where the descriptive analysis revealed that very few respondents (1.28) rated they access EIRs from the E-Library and the University Network. The study is in contrast with the study of Abbass &Song (2020) whose major findings indicated high level of accessibility to electronic information resources and high extent rate of utilization of the resources for research activities.

Conclusion and Recommendations

The study basically aimed at investigating the level of Awareness, Accessibility and Utilization of Electronic Databases in University Libraries in North-east Zone, Nigeria. The results revealed that there is low level of accessibility of electronic information resources. The study further concludes that users of the libraries do not have access to relevant e-databases in the libraries. However, increasing awareness and training users on how to use the electronic databases is crucial. When this is done, it is equally important to make those resources accessible to users by providing constant internet facilities, computer systems and electricity supply. The study revealed that awareness and use of databases among users was not evenly distributed. The study recommends constant training and creates more awareness on electronic databases available in the library. Constant internet should be made available in the academic environment with regular supply of electricity. The University Library should find an alternative way to generate power supply such as a standby generator, inverter or solar energy system. When users are trained regularly, and library resources are made accessible, there may be increased in the use of library materials and there by enhance effective teaching and research development.

Based on the conclusions drawn from the findings it is recommended that the library has a role to play in creating more awareness programs and mechanisms among users on the availability of electronic databases and this could be best achieved by developing a billboard, leaflet, posters, functional library website and the Mobile Library App, which could be used as a tool for creating awareness or advertising newly acquired electronic databases to the users. Institutional bandwidth should be increased. The Libraries should ensure accesses to these databases are readily available, usernames and passwords to these databases should be made available to the users.

References

Abbas, K.D. & Song, U.M. (2020) Accessibility and Utilization of Electronic Information Resources for Research Activities in Agricultural Research Institutes in Kaduna State, Nigeria. *Covenant Journal of Library & Information Science (CJLIS) 3 (1) June 2020*

Ahmed, S.M.Z. (2013). A Survey of Students' Use of and Satisfaction with University Subscribed Online-Resources in two Specialized Universities in a Developing Country. *Library Hi Tech News*, 30(3): 6-8.

Aina, R.F. (2014) "Awareness, Accessibility and use of Electronic Databases Among Academic Staff of Babcock University Business School "*Kuwait Chapter of Arabian Journal of Business and Management Review Vol. 3, No.6; Feb. 2014*

Akinola, A.O., Shorunke, O.A., Ajayi, S.A., Odefadehan, O.O. & Ibikunle, F.L. (2018) "Awareness and use of electronic databases by postgraduates in the University of Ibadan."

(2018). Library Philosophy and Practice (e-journal). 2065.http://digitalcommons.unl.edu/libphilprac/2065

Akpojotor, J. O., (2016). Awareness and usage of electronic information resources among postgraduate students of library and information science in southern Nigeria. *Library Philosophy and Practice e-journal* Paper 1408. Retrieved on 2nd September, 2016 from http://digitalcommons. unl.edu/libphilprac/1408.

Hamza, U. M., Aliyu, A., Maryam, B. Y., & Abbas, H. (2015). Use of Electronic Databases by the Academics of Faculty of Sciences Umaru Musa Yaradua University, Katsina , Nigeria. *Journal of Humanities and Science. 20* (50), 51-56.

Isibika, I.S. & Kavishe, G.F. (2018), "Utilisation of subscribed electronic resources by library users in Mzumbe university library, Tanzania", *Global Knowledge, Memory and Communication*, Vol. 67 No. 1/2, pp. 109-125. https://doi.org/10.1108/GKMC-09-2017-0075

Larson, A.G. (2017) "Faculty awareness and Use of Library Subscribed Online Databases in the University of Education, Winneba. Ghana: A survey." (2017). *Library Philosophy and Practice (e-journal)*. 1515. http://digitalcommons.unl.edu/libphilprac/1515

Liyi, Z. P., & Ye, Q. L (2011). Survey on the Utilization of Nstl Electronic Resources In Colleges and Universities in Wuhan, China. *The Electronic Library*, *29* (6), 828-840.

Mohammed T.L & Kannan, S. (2021) Awareness, Availability and Utilization of Databases Among Undergraduate Students of Federal University of Agriculture (FUAM) Makurdi Benue State" (2021). Library Philosophy and Practice (e-journal). 5082. https://digitalcommons.unl.edu/libphilprac/5082

Mollel, M.M & Mwantimwa, K (2019) Users' acceptance of e-resources usage at the Institute of Finance Management, Tanzania. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 2019, Vol. 15, Issue 4, pp. 5-21

Musa, A. U., Sahabi, M. K., Lawal, D. & Amishe, D. (2017). Academic librarians research productivity amidst open access resources: Issues and Challenges. Library and Information Management Forum 19(1 & 2). 56 – 70.

Naqvi, T. H., (2012). Use of electronic databases by postgraduate students and research scholars at GBPUAT library, India. *Library Philosophy and Practice e-journal*, Paper 809.

Neuman, W.L (2007) Basics of Social Research Methods: Qualitative and Quantitative Approaches 2nd Edition, Allyn and Bacon, Boston.

Nisha, F, & Ali, N.P.M. (2013). Awareness and Use of E-Journals by Iit Delhi And Delhi University Library Users. *Collection Building*, 32(2): 57-64.

Onyeneke, C.O (2019) Awareness and Use of E-Resources in Federal University of Technology Owerri (FUTO) By Staff and Students. *International Journal of Applied Technologies in Library and Information Management* 5 (2) 03 - 16-22.

Samaravickrama, P. G. R., & Samaradiwakara, (2014). Predicting Faculty Member Adoption of Online Databases by Diffusion Theory Approach: Case Study at the University of Sri Jayewardenepura in Sri Lanka. *2* (7) 87-97.

Song, I. S. & Song, U. M. (2017). Accessibility and Utilization of Electronic Information Resources by Postgraduate Students of Federal University Dutse for Research and Development *International Journal of Applied Technologies in Library & Information Management 3(3)* ISSN: (online) 2467 – 8120. 108-120, Retrieved from www.jatlim.org

STRATEGIES AND CHALLENGES FOR ACQUISITION OF ENTREPRENEURSHIP SKILLS AMONG POSTGRADUATE STUDENTS OF DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE IN UNIVERSITIES OF NORTH-WESTERN, NIGERIA

Ahmed Ibrahim
Federal University Gashua

Dr. Michael Esew
Ahmadu Bello University Zaria

Prof. Abu Yusufu
Ahmadu Bello University Zaria

Abstract

This research examines the Strategies and Challenges in Enhancing Entrepreneurship Skills Acquisition among postgraduate Library and Information Science (LIS) students in universities of North-Western Nigeria. The study was guided by two research questions: (1) What strategies are in place to enhance entrepreneurship skills acquisition in universities of North-Western Nigeria? and (2) What challenges do LIS students face in acquiring entrepreneurship skills in these universities? A quantitative research method was employed, utilizing a cross-sectional survey design. The study targeted students enrolled during the 2023/2024 academic session at four institutions: Ahmadu Bello University, Zaria; Bayero University, Kano; Federal University Dutsin-Ma, Katsina; and Umaru Musa Yar'adua University, Katsina. A total enumeration sampling technique was adopted, incorporating all 251 participants to ensure comprehensive data collection. Data were gathered through a closed-ended questionnaire, validated by research experts via face and content validity procedures. Frequency counts and percentages were used for data analysis, with a benchmark of 50% and above indicating positive responses, while items below 50% were deemed negative. The findings identified several strategies for enhancing entrepreneurship skills, including the integration of entrepreneurship-focused curricula, promotion of workshops, and fostering an environment of innovation. However, significant challenges were also noted, such as limited practical exposure, a lack of mentorship, and insufficient emphasis on entrepreneurship in the curriculum. The study concludes that while efforts to support entrepreneurship skills acquisition are evident, systemic improvements are necessary. These include greater industry engagement, practical training opportunities, and robust mentorship programs to better equip LIS students with the entrepreneurial competencies essential for their professional success.

Keywords: Challenges, Entrepreneurship Skills, Library and Information Science, postgraduate students, Strategies.

Introduction

The acquisition of entrepreneurship skills has become a pivotal component of education in the 21st century, particularly in fields like Library and Information Science (LIS). This focus is driven by the need to equip students with the competencies to navigate dynamic job markets and

create self-employment opportunities. Postgraduate LIS students in universities within Nigeria's North-Western States face unique challenges and opportunities in acquiring these skills. Entrepreneurship in LIS transcends traditional roles, requiring students to blend technical expertise, creative thinking, and strategic management to thrive in an increasingly competitive and technology-driven landscape (Anyanwu et al., 2013).

Entrepreneurship education fosters innovation, adaptability, and the ability to leverage resources effectively. Aldrich (2019) and Barringer and Ireland (2022) highlights the critical role of networking and strategic thinking in shaping entrepreneurial success, also stressing the importance of entrepreneurship education for developing information literacy and business acumen. For postgraduate students in LIS, acquiring these skills involves understanding digital tools, engaging with diverse professional networks, and identifying opportunities within and beyond the library sector. However, challenges such as limited resources, inadequate curriculum integration, and lack of mentorship hinder skill acquisition (Elonye & Uzuegbu, 2013; Willard, Letham, & McLeod, 2022).

The importance of addressing these challenges is underscored by the growing need for LIS professionals to embrace entrepreneurial roles. Studies by Longenecker, Moore, and Petty (2019) and Stanley and Oghenetega (2021) argue that entrepreneurial capabilities enhance career prospects and contribute to societal development. Moreover, innovative practices, as outlined by Chesbrough (2023), enable LIS graduates to leverage open innovation frameworks to create and sustain new ventures. Despite these prospects, postgraduate students often struggle with practical applications of entrepreneurship concepts, limited access to training resources, and cultural barriers that discourage entrepreneurial initiatives (Rosenfeld & DuMont, 2020; Lampert, 2021).

This research seeks to discover the strategies in place for enhancing entrepreneurship skills acquisition among postgraduate LIS students in universities within Nigeria's North-Western States. It also investigates the challenges the LIS students encounter in this process. By analyzing these variables, the study aims to provide insights into how entrepreneurship education can be improved to meet the demands of a changing professional environment.

Statement of the Problem

Entrepreneurship skills are essential for postgraduate students of Library and Information Science (LIS), as they enable innovation, adaptability, and the exploration of diverse career opportunities in an ever-changing information landscape. These skills are pivotal in preparing LIS students to address evolving user needs, create innovative solutions, and contribute to national development and the advancement of the information science profession (Willard, Letham, & McLeod, 2022). By fostering entrepreneurial competencies, LIS programs can equip students with the tools needed to achieve professional success and make meaningful contributions to the information sector.

Despite the recognized importance of entrepreneurship skills, there is a lack of empirical research focusing on the preparedness and challenges of postgraduate LIS students in the North-Western States of Nigeria. While previous studies have explored entrepreneurship in LIS in other regions and contexts (Anyanwu et al., 2013 & Elonye & Uzuegbu, 2013), limited attention has

been given to the specific strategies and obstacles faced by students in this region. Existing studies largely concentrate on undergraduate students or professionals in other parts of Nigeria, leaving a critical gap in understanding the unique circumstances of postgraduate students in North-Western universities.

This gap raises concerns about whether these students are adequately prepared to leverage entrepreneurial skills to achieve self-reliance and professional success in the LIS field. Addressing this gap, the current study seeks to examine the strategies for enhancing entrepreneurship skills acquisition among postgraduate LIS students in the universities of North-Western Nigeria. It also aims to identify the challenges they face, thereby providing insights to bridge the gap between education and practice in entrepreneurial endeavors within the LIS discipline.

Research Questions

The following research guided this study:

1. What are the strategies put in place in enhancing the acquisition of entrepreneurship skills among PG students in Universities of North Western States, Nigeria?
2. What are the challenges faced by PG students of Library and Information Science in the acquisition of entrepreneurship skills in Universities of North Western States, Nigeria?

Literature Review

Entrepreneurship education aims at producing graduates who are well suited for the job market that has very few employment opportunities and thus calls for creativity in graduates to improve on their employability and self-employment. It is therefore necessary for entrepreneurship education to be developed in relation to the current demands in the socio-economic environment that the society is currently operating. According to Brooks, et al., (2017) entrepreneurship education needs to adopt a multidisciplinary approach that is responsive to the actual needs of the market. Aina, (2007) as cited in Nnadozie, Akanwa & Nnadozie, (2018) also noted that library training curriculum should be pertinent to the immediate environment and imitate the best global practices. This makes it imperative for Library and Information Science curriculum to be enhanced regularly with emphasis on the integration of entrepreneurship education in the Library and Information Science program.

On the other hand, Ejedafiru & Oghenevwogaga, (2022) observed that LIS curricular should incorporate entrepreneurship education so that entrepreneurial potential of LIS students can be cultivated. They opined that this can be realized through an education system that is self-sustaining and has the capacity of preparing students with ability, attitude and standards needed for enhanced information services and handling the growing entrepreneurship prospects brought by new technologies. A study was carried out in Eastern Africa to assess the capacity of business schools and other learning institution to support the growth of entrepreneurship. This study was done in collaboration between the School of Business of the University of Nairobi and Plymouth University Business School and supported by UK Department for International Development. The study engaged three countries: Kenya, Tanzania and South Sudan. According to the assessment in Kenya, entrepreneurship education is not yet mainstreamed across the curriculum of higher institution of learning. However, the study noted that Kenya's higher education was strategically

evolving to more systematic approach to entrepreneurship education (Kaijage, Wheeler & Newbery, 2019).

Similarly, a World Bank study to examine entrepreneurship education and training in three countries in sub-Saharan Africa, concentrated on Kenya, Ghana, and Mozambique. According to the study, entrepreneurship in Kenya is incorporated in the formal curriculum across all educational streams and levels apart from primary education (Robb, Valerio & Parton, 2020). It was observed that Kenya had focused to institutionalize entrepreneurship education through making it part compulsory in public education system. Parton, (2020) observed that entrepreneurial education programs in Kenyan education system started when Know About Business (KAB) approach was implemented. This was a branded technique for entrepreneurship education focused on developing business awareness amongst students. KAB advanced by International Labour Organization (ILO) is thought as a teaching technique that is hands-on and experimental and focuses on practical learning (Robb, Valerio, & Parton, 2020).

There are many challenges that associated with entrepreneurship skills on job opportunities which include low competence of entrepreneurship education lecturers/instructors; absence of curricular capacity to support, poor Infrastructural support poor availability of infrastructure for entrepreneurship education to deliver quality and practical oriented entrepreneurship education requires huge investment in capital. However, inadequate funding is indicted in the poor infrastructural support entrepreneurship education to drive quality delivery of entrepreneurship education (Kuratko & Audretsch, 2019). (Henry, Jonathan and Olakunle, 2021) also observed that finance, inadequate equipment and technology, economic pressure from parents, education, entrepreneurial attitude, data, inadequate infrastructural facilities, cultural barriers and research and linkages are part of challenges associated with entrepreneurial skills on job opportunities.

Meanwhile, Odia and Odia (2018) consider developing entrepreneurial skills and transforming challenges into business opportunities in Nigeria. Today, the twin challenges of unemployment and poverty are facing graduates of tertiary institutions and professionals owing to the global economic meltdown and economic recessions in most countries including Nigeria. While the government braces up to these challenges through the various programmes and entrepreneurial initiatives, a key solution is the equipping of graduates and professionals with entrepreneurial skills which can make them employable and become employers of labour.

Elonye, and Uzuegbu, (2018) investigated Challenges that hinder the availability of instructional resources and acquisition of entrepreneurial skills among Business Education students in tertiary institutions, Rivers State. A descriptive survey research design was adopted in the study. The study was carried out in Rivers State, with two research questions and two null hypotheses, and a population consisting of 409 final year students offering Business Education programme drawn from the three tertiary institutions in Rivers State. Purposive sampling was adopted as the entire population was used as the Sample size. The study used mean and standard deviation to test the two hypotheses. The study found out that not adequate and inadequate funding, lack of maintenance, poor policy formulation amongst others are challenges that hinders entrepreneurship skills.

Furthermore, Fatoki and Chindoga (2021) added that exogenous factors such as the fear of failure, lack of business skills and lack of willingness to take risk were obstacles to youth entrepreneurship in South Africa. In addition, Yeboah, Kumi and Awuah (2020) pointed out that the biggest obstacle to entrepreneurial skills among Sunyani Polytechnic marketing students in Ghana is lack of collateral security. Idam (2019) emphasize the devastating effect of poor infrastructural facilities, including epileptic power supply, poor condition of road network and inadequate water supply on emerging businesses. As rightly summarized by Anyanwu et..el (2013) the factors limiting the effectiveness of entrepreneurship education in Nigerian library schools:Non-challant Attitude of Student: As rightly pointed out by Ifedili and Ofoegbu (2011), there seems to be no seriousness among many students in the participation of the course as many of them see the course as one of those unnecessary courses imposed on them to fulfil graduation requirements.

Lack of Functional Workshop and Laboratories: - Most of the Nigerian library schools lacks of functional workshop and laboratories. A visit to these laboratories will reveal that Nigerian library schools lacks the standing locus to teach entrepreneurship when in actual sense the workshop that exist cannot empower effective teaching of core courses like cataloguing and classification how much more entrepreneurship education. We must call a spade a spade if at all we are sincere in the movement along the wind of entrepreneurship. The poor state of infrastructural facilities is nothing to write home about especially in this ICT driven age. If entrepreneurship education must takes its proper place, then heads of library schools has to go back and work out modalities of ensuring that our library school are re-invigorated.

Lack of ICT Skills:- In this digital age, where virtually every sector of human endeavor is ICT driven, It goes to mean that lack of ICT skills is a limiting factor to effective integration of entrepreneurship education to library and information science. The practical approach to book publishing in traditional and electronic environment is not possible without basic ICT skills. Since most teachers teaching entrepreneurship lacks the basis ICT skills, do we expect a magic to make the students acquire these skills, if it happens, then it must be an "entrepreneurial miracle".

Unavailability of Lecturers that are Entrepreneurial Conscious: Most lecturers in the university and polytechnics are not entrepreneurial conscious and this apparently affects their mode of teaching and we don't expect such lecturers to impart the right knowledge to the student. This ugly trend does affect the overall objective of entrepreneurship education.

Unavailability of Fund: Behind any successful project is availability of finance. For entrepreneurship education to be fully integrated into the educational system and achieve its objective, then finance ought to be available. The laboratories found in our tertiary institution can only be upgraded if the fund is available. When the various bodies and stakeholders find it extremely difficult to release funds, one will wonder how the library schools will manufacture the necessary equipment needed to impart the right skills to the students.

Methodology

A quantitative research method was employed for this study, utilizing a cross-sectional survey design. The research focused on students enrolled during the 2023/2024 academic session

at Ahmadu Bello University, Zaria; Bayero University, Kano; Federal University Dutsin-Ma, Katsina; and Umaru Musa Yar'adua University, Katsina. A total enumeration sampling technique was adopted, incorporating the entire population of 251 participants to ensure comprehensive data collection. Data were collected using a closed-ended questionnaire, which was validated by research experts through face and content validity procedures. Frequency counts and percentages were used to analyze the research questions. A benchmark of 50% and above was set to indicate positive responses, while items with response rates below 50% were considered negative.

Findings and Discussions

The findings and discussions section presents the results of the study and interprets them in relation to the research questions, objectives, and relevant literature.

Response Rate

From the 251 copies of the questionnaire distributed to four universities studied, 214 copies (85%) were duly completed, returned and found useful for the research. 130 (55%) of the respondents were from ABU, Zaria, followed by 51 (20%) from Bayero University kano,. followed by 23 (9%) from federal university, Dutsimma. While the least respondents in the study from Umaru Musa Yar'adua University, Katsina is with 10 (4%). The reason for this high response rate could be attributed to the fact that the researcher with the help of three research assistance administered and collected the questionnaire after several follow up.

Strategies put in place in enhancing the acquisition of entrepreneurship skills in Universities of North Western States, Nigeria

To identify the Strategies put in place in enhancing the acquisition of entrepreneurship skills in Universities of North Western States, Nigeria, the respondents were presented with a list and requested to tick the one they possess. Table 4.5. Shows the responses

Table 1 Strategies for enhancing the acquisition of entrepreneurship skills

S/N	Strategies for enhancing the acquisition of entrepreneurship skills	Frequency	Percentage %
1	Integration of entrepreneurship courses into the LIS curriculum	134	63
2	Offering workshops and seminars on entrepreneurship	107	50
3	Providing mentorship programs with industry professionals	99	46
4	Establishing incubation centers or entrepreneurship hubs	71	33
5	Encouraging participation in entrepreneurship competitions	72	34
6	Facilitating internships or practical experiences in entrepreneurial settings	88	41
7	Partnering with industry organizations for hands-on training	67	31
8	Incorporating case studies and real-world projects into coursework	69	32
9	Providing access to resources and funding for entrepreneurial ventures	100	47

10	Fostering a culture of innovation and creativity within the academic environment	130	61

Source: Researcher's Field Survey, 2024

The findings from table 1 reveal that certain strategies for enhancing the acquisition of entrepreneurship skills among Library and Information Science students in Universities of North Western States, Nigeria are more prominently emphasized. Integration of entrepreneurship courses into the LIS curriculum (62.62%) and fostering a culture of innovation and creativity within the academic environment (60.75%) stand out as the most frequently implemented strategies. Offering workshops and seminars on entrepreneurship (50.00%) also meets the threshold, indicating its significant role in promoting entrepreneurial skills development among students.

Conversely, several strategies fall below the 50% mark, highlighting areas with less emphasis. These include providing mentorship programs with industry professionals (46.26%), facilitating internships or practical experiences in entrepreneurial settings (41.12%), and encouraging participation in entrepreneurship competitions (33.64%). Establishing incubation centers or entrepreneurship hubs (33.18%), partnering with industry organizations for hands-on training (31.31%), and incorporating case studies and real-world projects into coursework (32.24%) also reflect lower prioritization.

The findings from the study indicate that strategies with a 50% and above response rate were perceived as positive and should continue to be emphasized in enhancing the acquisition of entrepreneurship skills among Library and Information Science (LIS) students in tertiary institutions in Kaduna State. Notably, strategies such as the integration of entrepreneurship courses into the LIS curriculum, offering workshops and seminars on entrepreneurship, providing mentorship programs with industry professionals, and establishing incubation centers or entrepreneurship hubs were widely supported. These strategies align with existing literature, particularly with Ejedafiru & Oghenevwogaga (2022), who highlight the significance of integrating entrepreneurship into academic curricula, as it fosters students' entrepreneurial knowledge and competencies. Similarly, Robb, Valerio & Parton (2020) emphasize that incubation centers and professional mentorship programs create an environment conducive to developing entrepreneurial skills, aligning with the positive reception of these strategies in the study.

However, strategies that garnered less than 50% support, such as encouraging participation in entrepreneurship competitions, partnering with industry organizations for hands-on training, and incorporating case studies and real-world projects into coursework, demand improvement. These areas reflect gaps that need to be addressed in order to fully support the development of entrepreneurial skills in LIS students. Parton (2020) emphasizes that exposure to real-world projects and industry engagement plays a vital role in shaping students' practical skills. Therefore, efforts to increase student participation in competitions and enhance partnerships with industry for hands-on experiences should be prioritized. Additionally, incorporating more real-world scenarios into the curriculum could strengthen students' ability to adapt to dynamic entrepreneurial environments. By focusing on improving these strategies, tertiary institutions can ensure a more comprehensive and balanced approach to entrepreneurship education.

If the strategies with less than 50% support, such as encouraging participation in entrepreneurship competitions, partnering with industry organizations for hands-on training, and incorporating case studies and real-world projects into coursework, are not adequately implemented, it could result in a lack of practical exposure for LIS students. This deficiency may limit their ability to develop essential entrepreneurial skills, making them less competitive and adaptable in the job market. Furthermore, without sufficient industry engagement and real-world application, students may struggle to connect theoretical knowledge with practical entrepreneurial opportunities, which could hinder their ability to innovate and succeed in entrepreneurial ventures. As a result, the gap between academic preparation and actual industry requirements may widen, leading to graduates who are not fully equipped to navigate the entrepreneurial landscape.

Challenges faced by students of Library and Information Science in the acquisition of entrepreneurship skills in Universities of North Western States, Nigeria

To identify the Challenges faced by students of Library and Information Science in the acquisition of entrepreneurship skills in Universities of North Western States, Nigeria, the respondents were presented with a list and requested to tick the one they possess. Table 4.5. Shows the responses

Table 2 Challenges faced by students of Library and Information Science in the acquisition of entrepreneurship skills

S/N	**Challenges faced by students**	Frequency	Percentage%
1	Limited practical exposure	178	83
2	Lack of entrepreneurship-focused curriculum	174	81
3	Insufficient mentorship and guidance	140	65
4	Limited access to resources and funding	101	47
5	Traditional focus on theoretical knowledge	167	78
6	Limited industry connections and networking opportunities	145	68
7	Perceived lack of relevance of entrepreneurship to LIS field	100	47
8	Resistance to change within academic institutions	80	37
9	Time constraints due to heavy academic workload	89	43
10	Cultural or societal stigma against entrepreneurship	70	33%

Source: Researcher's Field Survey, 2024

The findings from table 2 indicate that several challenges faced by students in acquiring entrepreneurship skills are significant, with percentages above 50%. The most prominent challenge is limited practical exposure, identified by 83.2% of respondents. This is closely followed by the lack of an entrepreneurship-focused curriculum (81.3%) and a traditional focus on theoretical knowledge (78.0%). Other notable challenges include limited industry connections and networking opportunities (67.8%) and insufficient mentorship and guidance (65.4%).

Conversely, challenges with percentages below 50% include limited access to resources and funding (47.2%), perceived lack of relevance of entrepreneurship to the LIS field (46.7%), time constraints due to heavy academic workloads (41.6%), resistance to change within academic institutions (37.4%), and cultural or societal stigma against entrepreneurship (32.7%).

The findings reveal a range of challenges faced by students of Library and Information Science (LIS) in acquiring entrepreneurship skills, echoing similar observations in prior research. Limited practical exposure, highlighted as a major barrier, aligns with Yeboah, Kumi, and Awuah (2020), who emphasize the necessity of experiential learning in bridging the gap between theoretical knowledge and real-world applications. Without adequate practical opportunities, students struggle to develop the confidence and hands-on experience necessary for entrepreneurial success.

The lack of an entrepreneurship-focused curriculum further underscores structural gaps in LIS education. Adejimola (2020) asserts that the integration of entrepreneurship within academic programs is crucial for fostering innovation and self-reliance among students. This absence, coupled with insufficient mentorship and networking opportunities, limits students' ability to connect with industry professionals and gain insights into market trends, as also noted by Idam (2019). Additionally, the traditional emphasis on theoretical knowledge over applied skills mirrors findings from Anyanwu et al. (2013), who argue that academic institutions often undervalue the practical competencies essential for entrepreneurial endeavors.

The implications of these challenges are multifaceted. Addressing them requires a paradigm shift in LIS education, focusing on practical training, curriculum reform, and strengthened industry-academia collaborations. Providing students with mentorship and opportunities for real-world engagement can enhance their entrepreneurial competencies and prepare them for dynamic professional environments. Failure to address these barriers risks perpetuating a disconnect between LIS education and the evolving demands of the job market, ultimately hindering students' ability to contribute innovatively to the information profession.

Conclusion and Recommendations

It was concluded that while strategies like integrating entrepreneurship courses and fostering innovation have been implemented to enhance entrepreneurship skills among postgraduate LIS students in universities of North Western States, Nigeria, these efforts are yet to fully realize their potential. Significant challenges, such as limited practical exposure and insufficient mentorship, persist, hindering the comprehensive development of students' entrepreneurial capabilities and opportunities for self-reliance. The study recommended that universities should implement mentorship programs with industry professionals, facilitate internships, and encourage participation in entrepreneurship competitions to provide practical learning experiences. Establishing incubation centers and partnering with industry organizations will support venture development, while incorporating real-world projects and case studies into coursework will prepare students for entrepreneurial success. Universities should also adopt a practice-oriented curriculum design with hands-on activities like internships, workshops, and practical projects will enhance students' entrepreneurial skills. Universities should develop an entrepreneurship-focused LIS curriculum, establish industry partnerships for networking and

mentorship, and prioritize faculty training and resource provision to foster innovation and skill acquisition.

References

Adejimola, A. S. (2020)/Language, Communication and Information Flow in Entrepreneurship. *African Journal of Business Management, 2(10*), 201-208

Aldrich, H. (2019). Networking for organizations, communities, and entrepreneurs. Journal of Management Studies, 56(3), 673-681.

Anyanwu, E. U., Oduagwu, E. A., Ossai-Onah, O. V., & Amaechi, N. M. (2013). Repositioning library and information science graduates in Nigeria for self employment through entrepreneurship education. American International Journal of Contemporary Research, 3(8), 178-184.

Barringer, B. R., & Ireland, R. D. (2022). Entrepreneurship: Successfully launching new ventures. Pearson.

Chesbrough, H. W. (2023). Open innovation: The new imperative for creating and profiting from technology. Harvard Business Press.

Ejedafiru, E. F., & Toyo, D. O. (2022). Promoting entrepreneurship in Library and Information Science for self-reliance: paradigm shift for Library and Information Science graduates in Nigeria. *International Journal of Library and Information Science, 1*(2), 70-77.

Elonye, G. U., & Uzuegbu, C. P. (2013). Entrepreneurial opportunities for library and information science (LIS) professionals in contemporary society. The Research Librarian, 7(1), 23-42.

Fatoki, O. O., & Chindoga, L. (2021). An investigation into the obstacles to youth entrepreneurship in South Africa. *International Business Research, 4*(2), 161-169.

Henry C. J., Jonathan C. N., & Olakunle, A. S. (2021). Freelance librarianship: A source of income for unemployed library and information science graduates. *International Journal of Advanced Library and Information Science, 5*(1), 420-427.

Idam, L. E. (2019). Entrepreneurship development in Nigeria: A review. *Journal of Business and Management, 16*(1), 01-07.

Kaijage, E., Wheeler, D., & Newbery, R. (2019). *Supporting Entrepreneurship Education in East Africa*. Retrieved from Plymouth University website: https://www.plymouth.ac.uk/uploads/production/document/path/5/5840/Supporting_entrepreneu ship_in_East_Africa.pdf

Kuratko, D., & Audretsch D (2019). Strategic entrepreneurship: Exploring different perspectives of an emerging concept. *Entrepreneurship Theory and Practice,33*(1), 1-17.

Lampert, C. (2021). Special librarianship. In Encyclopedia of library and information sciences (pp. 1-13). Taylor & Francis.

Longenecker, J. G., Moore, C. W., & Petty, J. W. (2019). Small business management: Launching and growing entrepreneurial ventures. Cengage Learning.

Nnadozie, C. O., Akanwa, P. C., & Nnadozie, C. D. (2018). Impact of Entrepreneurship Education on the Career Aspirations of Nigerian Para-Professional Librarians-in-Training. *Academic Journal of Interdisciplinary Studies*, *2*(5), 149 - 169. doi:10.5901/ajis.2013.v2n5p149

Odia J.O. & Odia. A.A. (2018. Developing Entrepreneurial Skills and Transforming Challenges into Opportunities in Nigeria. *Journal of Educational and Social Research MCSER Publishing, RomeItaly* 3(3), 76-74

Robb, A., Valerio, A., & Parton, B. (2020). *Entrepreneurship Education and Training: Insights from Ghana, Kenya, and Mozambique*. Washington: World Bank Publications.doi:10.1596/978-1-4648-0278-2.

Rosenfeld, H. F., & DuMont, R. R. (2020). Problem solving strategies for LIS professionals. Library & Information Science Research, 42(1), 101112.

Willard, E., Letham, Y., & McLeod, J. (2022). Looking beyond libraries: Developing entrepreneurial capabilities in library and information science students. Library Trends, 67(3), 397-420

Yeboah, A. S., Kumi, E., & Awuah, B. J. (2020). An Assessment of Entrepreneurship Intention among Sunyani Polytechnic marketing student. *International Review of Management and Marketing*, *3*(1), 37-49.

BARRIERS TO ADOPTION CYBERCRIME MITIGATION TECHNIQUES AMONG UNIVERSITY ICT PERSONNEL: INSIGHTS FROM AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA

ALIYU, Usman Shehu
Ibrahim Badamasi Babangida University, Lapai, Nigeria

JAMILU, Yahaya Maipan-uku PhD,
Ibrahim Badamasi Babangida University, Lapai, Nigeria

ABDULRAHMAN, Abdulganiyu PhD,
Ibrahim Badamasi Babangida University, Lapai, Nigeria

ADAMU, Abubakar Isah PhD,
Ibrahim Badamasi Babangida University, Lapai, Nigeria

Abstract

The study examined the barriers to adopting cybercrime mitigation techniques among university ICT personnel: Insights from Ahmadu Bello University (ABU), Zaria. The objectives were to identify the skills and competences possessed by Information and Communication Technology (ICT) Staff of ABU, Zaria for preserving portal data, to identify the challenges encountered by ICT Staff of ABU, Zaria in adopting Cybercrime Management Techniques for preserving portal data. Quantitative research methodology was adopted for this study using cross-sectional survey research design. The study comprised of seventy-two (72) staff of the four (4) ICT units of the university. The entire population was used as sample size and total population sampling technique was adopted for the study. The instrument used for collecting data was self-developed questionnaire, the instrument was validated using face and content validity criteria. The data collected were analyzed using frequency distribution and percentages. The study found out that, user support is the most possessed skill and competence by ICT staff in ABU, Zaria for handling portal, also the study discovered that, system downtime and reliability; funding and budget constraints are the main challenges encountered by ICT Staff of ABU, Zaria in adopting cybercrime management techniques for handling of portal. The study concluded that, the need for a holistic cybersecurity strategy that addresses both people and systems. The study recommended that; the university's ICT department, in partnership with the human resources unit, should initiate professional development programs to improve project management skills among ICT staff. The university management should allocate dedicated funding for cybersecurity infrastructure and maintenance to minimize system downtime and enhance reliability.

Keywords: Adoption, Barriers, Cybercrime Mitigation Techniques, Data, Portal Techniques

Introduction

The exponential growth of digital infrastructure in higher education institutions has fundamentally transformed the landscape of academic administration, research, and student services. University portal systems, which serve as critical gateways for academic records, financial transactions, and sensitive institutional data, have become increasingly attractive targets

for cybercriminals (Aloul, 2012). The sophistication and frequency of cyber-attacks against educational institutions have escalated dramatically, with universities experiencing data breaches, ransomware attacks, and distributed denial-of-service (DDoS) incidents that compromise both operational continuity and stakeholder trust (Edu & Ofem, 2020). Information and Communication Technology (ICT) personnel within universities occupy a pivotal position in safeguarding these digital assets. Their competencies, preparedness, and capacity to implement effective cybercrime mitigation strategies directly influence institutional resilience against evolving cyber threats. However, the gap between theoretical cybersecurity frameworks and practical implementation within university environments remains a significant concern, particularly in developing nations where resource constraints and infrastructure challenges compound the complexity of cybersecurity management (Okafor & Aigbavboa, 2019; Onwubiko & Ouazzane, 2021).

The Nigerian cybersecurity landscape presents unique challenges that influence university-level implementation strategies. The National Cybersecurity Policy and Strategy (2021) acknowledges significant gaps in cybersecurity capacity across educational institutions, emphasizing the need for targeted interventions to strengthen institutional capabilities. Comparative studies examining cybersecurity frameworks in Nigerian universities reveal inconsistent implementation approaches, with many institutions relying heavily on reactive rather than proactive security measures (Ajayi & Hussin, 2018). International frameworks such as ISO/IEC 27001 and NIST Cybersecurity Framework provide comprehensive guidelines for organizational cybersecurity management. However, research by Tawalbeh et al. (2020); Adeleke and Nwankpa (2019) suggests that direct implementation of these frameworks within resource-constrained environments often requires significant adaptation to address local infrastructure and capacity limitations. The tension between international best practices and local implementation realities creates complex challenges for university ICT departments attempting to establish effective cybercrime mitigation strategies.

Ahmadu Bello University, Zaria (ABU-Zaria), as one of Nigeria's premier institutions of higher learning, represents a significant case study for understanding the dynamics of cybercrime mitigation in Nigerian academic contexts. With over 45,000 students and extensive digital infrastructure supporting academic and administrative operations, the university's portal systems process substantial volumes of sensitive data daily. The institution's experience in managing cybersecurity challenges offers valuable insights into the broader patterns of cyber threat management within Nigerian universities. This article explores the competencies possessed by ICT staff at ABU-Zaria and examines the barriers they encounter in adopting comprehensive cybercrime mitigation techniques for portal data preservation. The research aims to bridge the knowledge gap between cybersecurity theory and practical implementation challenges within university environments, providing empirical evidence to inform policy development and resource allocation decisions in academic cybersecurity management.

Statement of the Problem

Despite the vital role of robust cybersecurity in safeguarding university portals, Ahmadu Bello University, Zaria faces a significant imbalance: while ICT personnel are highly skilled in user-support functions like helpdesk services, end-user training, and basic troubleshooting, they lack advanced technical expertise in areas such as network security, threat

detection, and incident response. This shortfall, compounded by unreliable infrastructure frequent downtime and unstable networks and constrained budgets that restrict access to modern security tools and training, hampers the institution's ability to fully adopt effective cybercrime mitigation strategies. As a result, the university remains vulnerable to sophisticated cyber threats like DDoS attacks, malware, and data breaches particularly during critical academic periods, risking data integrity, operational availability, reputation, and stakeholder trust, while perpetuating a reactive, costly, and ultimately unsustainable security posture.

Objectives of the Study

1. To identify the skills and competences possessed by Information and Communication Technology Staff of Ahmadu Bello University, Zaria for preserving portal data.
2. To identify the barriers encountered by Information and Communication Technology Staff of Ahmadu Bello University, Zaria in adopting Cybercrime Management Techniques for preserving portal data.

Literature Review

Preserving portal data effectively requires a blend of technical and soft competencies. Technically, ICT personnel must be proficient in **database management,** including query formulation, data migration, metadata handling, secure storage architectures, and system procurement skills that support the integrity and accessibility of portal information. They must also understand **information security principles**, such as risk assessment, vulnerability scanning, encryption, and adherence to compliance standards, to proactively protect against cyber threats. In addition, **general IT literacy** including routine tasks like backup, troubleshooting, repository management, and software maintenance is vital for day-to-day operations. Finally, **analytical thinking and critical problem-solving** enable IT teams to assess system performance, identify emerging issues, and tailor solutions ensuring that portal systems remain reliable, secure, and responsive to evolving needs.

1. Database Management Skill

According to Uche et al., (2022) database management is a critical skill for cybercrime management, especially in academic institutions that handle vast amounts of sensitive data. Proficiency in this area involves the ability to organize, store, secure, and retrieve data efficiently within a database system. Universities rely on databases to manage information such as student records, academic results, research data, and financial details. Cybercrime management professionals must understand database management systems (DBMS) like MySQL, Oracle, and Microsoft SQL Server to protect these databases from threats like SQL injection attacks, unauthorized access, and data breaches. An essential competence here is setting up robust access controls, encryption mechanisms, and regular backups to secure data integrity and confidentiality (Aloul, 2012).

2. Cybersecurity Knowledge

Comprehensive cybersecurity knowledge is fundamental for effectively managing cyber threats against university portals. This includes a deep understanding of cyberattack methodologies, threat intelligence, and defense strategies. Cybersecurity professionals must be adept in areas such as malware analysis, penetration testing, and the application of security frameworks like the National

Institute of Standards and Technology (NIST) or ISO/IEC 27001 (Tientcheu, 2021). These competencies allow them to identify vulnerabilities, assess risks, and implement proactive measures to prevent attacks on the university's digital infrastructure (Edu & Ofem, 2020). In addition to technical knowledge, cybersecurity professionals must be well-versed in security policies, compliance regulations, and best practices. For universities, this might involve adhering to data protection laws such as the General Data Protection Regulation (GDPR) or local privacy regulations (Uche et., 2022).

3. Network Administration Skill

Network administration is another vital competence in cybercrime management, particularly in ensuring the security of university portals and their associated networks. A network administrator's role involves managing, maintaining, and securing the university's network infrastructure, which includes routers, switches, firewalls, and other networking hardware. Proficiency in network configuration, monitoring, and troubleshooting is essential to protect against cyber threats like Distributed Denial of Service (DDoS) attacks, unauthorized network access, and data interception (Furnell & Clarke, 2012). Effective network security management includes implementing firewalls, intrusion detection systems (IDS), and virtual private networks (VPNs) to create a multi-layered defense. Network administrators must also establish secure network protocols and segment the network to limit the spread of potential breaches. For instance, isolating sensitive segments, such as research databases, from the general campus network can prevent unauthorized access.

4. Web Development and Maintenance Skills

Web development and maintenance are crucial skills in the realm of cybercrime management, especially for securing university portals and online systems. Professionals with web development expertise are responsible for creating secure web applications and maintaining their integrity against cyber threats. This includes knowledge of secure coding practices, such as input validation and proper error handling, to prevent common vulnerabilities like SQL injection, cross-site scripting (XSS), and cross-site request forgery (CSRF). By understanding the intricacies of web development frameworks, languages (like HTML, CSS, JavaScript, and PHP), and content management systems (CMS), developers can build robust portals that are resilient to attacks (Ajayi & Hussain, 2018).

5. Data Encryption and Privacy Skills

Data encryption is a fundamental skill in cybercrime management, focusing on protecting sensitive information by converting it into unreadable code that can only be deciphered by authorized users with the correct decryption key. Universities handle a wealth of sensitive data, including personal student information, financial records, and research data, making encryption a vital tool for maintaining data privacy and security. Professionals skilled in data encryption use advanced algorithms like Advanced Encryption Standard (AES), RSA, and Secure Sockets Layer (SSL) to safeguard data at rest and in transit. This ensures that even if cybercriminals intercept data, they cannot easily decipher it (Taher et al., 2020).

6. Incident Response and Management

Incident response and management are critical skills for handling cyberattacks effectively when they occur. These skills involve the ability to detect, respond to, and recover from cybersecurity

incidents in a structured and timely manner. For universities, which are frequent targets of cyberattacks due to their rich repositories of sensitive data, having a robust incident response plan (IRP) is essential. Cybersecurity professionals must be adept at developing and executing IRPs that include steps for identification, containment, eradication, and recovery from cyber incidents. This structured approach helps minimize damage, restore normal operations quickly, and reduce the impact on academic and administrative functions (Soomro et al., 2016).
Other skills and competencies include; access control management, problem-solving and analytical thinking, software update and patch management, user-support and training, compliance and regulatory knowledge, project management skill.

Barriers encountered by ICT Staff in adopting Cybercrime Management Techniques
The challenges were identified and discussed:

1. **User Authentication Issues**

According to Tientcheu et al., (2021), user authentication issues present significant challenges to the effective adoption of cybercrime management strategies on university portals. Ensuring that users students, faculty, and staff can securely and reliably access university resources is fundamental, yet implementing strong authentication measures often leads to usability concerns. Techniques like multi-factor authentication (MFA), while highly effective in reducing unauthorized access, can be perceived as cumbersome by users. Frequent prompts for additional verification, complex password requirements, or the need to use authentication apps can result in frustration, leading to decreased compliance and an increased likelihood of users finding ways to bypass security measures (Tientcheu et al,. 2021). Moreover, technical issues related to authentication systems can hinder their effectiveness. For example, network connectivity problems, outdated software, or system outages can prevent users from accessing the portal, especially during critical times like exams or registration periods. This not only disrupts the academic and administrative activities but also reduces trust in the security measures put in place. If authentication systems are perceived as unreliable, users may resist their adoption, preferring simpler but less secure methods, thereby undermining the institution's overall cybersecurity efforts (Edu & Ofem 2020).

2. **Software Bugs and Technical Glitches**

Software bugs and technical glitches are persistent challenges that impede the successful implementation of cybercrime management strategies on university portals. The complexity of cybersecurity software, coupled with frequent updates and patches, can introduce bugs that compromise system functionality. For instance, a newly deployed security patch may conflict with existing software, causing disruptions in the portal's operations or even leading to vulnerabilities that cybercriminals could exploit. These technical issues can delay the adoption of essential security measures, leaving university portals exposed to potential cyber-attacks (Taher et al., 2020).

3. **Integration with Other Systems**

Integration with existing systems is another significant challenge in the adoption of cybercrime management strategies on university portals. Universities typically use a range of software solutions for various functions like student management, finance, human resources, and learning management. Ensuring that new cybersecurity tools are compatible with these existing systems

can be a complex task. For instance, integrating a new firewall or intrusion detection system with legacy systems may require significant customization, leading to increased costs and implementation time. Compatibility issues can hinder the seamless operation of university portals, creating security gaps that cybercriminals can exploit (Taher et al., 2020).

4. User Resistance and Low Adoption

User resistance and low adoption rates are significant barriers to the successful implementation of cybercrime management strategies on university portals. Despite the clear benefits of robust cybersecurity measures, users may resist changes due to perceived complexity, inconvenience, or lack of understanding. For instance, students and faculty members may be reluctant to adopt multi-factor authentication or frequent password changes, viewing them as unnecessary hurdles. This resistance can lead to poor compliance with security protocols, leaving university systems vulnerable to attacks (Taher et al., 2020). The issue of user resistance is often rooted in inadequate communication and training. If users are not properly educated on the importance of cybersecurity and how new measures protect their data, they are unlikely to embrace these changes. Universities must invest in ongoing cybersecurity awareness programs to demonstrate the value of security practices, address user concerns, and provide hands-on training. Without this educational component, even the most advanced cybercrime management strategies may fail to gain user acceptance, limiting their effectiveness (Uche et al., 2022).

5. Cybersecurity Threats

Cybersecurity threats pose significant challenges to the adoption of cybercrime management strategies on university portals. Universities are increasingly targeted by cybercriminals due to the vast amount of sensitive data they handle, including personal information, financial records, and proprietary research. The constant evolution of cyber threats, such as ransomware, phishing, and malware, makes it difficult for universities to keep their defenses up to date. This ever-changing threat landscape requires continuous investment in security measures, which can be both financially and logistically challenging for academic institutions. The complexity of these threats often leads to hesitation in adopting new cybercrime management strategies due to concerns over their effectiveness against sophisticated attacks (Adeleke & Nwankpa, 2019).

Other challenges include; data privacy and compliance, system downtime and reliability, limited technical expertise, data backup and recovery, performance optimization, funding and budget constraints, user support and training, continuous maintenance and update.

Methodology

Quantitative research methodology was adopted for this study using cross-sectional survey research design. The study comprised of seventy-two (72) staff of the four (4) ICT units of the university. The entire population was used as sample size and total population sampling technique was adopted for the study. The instrument used for collecting data was self-developed questionnaire. The Instrument was validated using face and content validity criteria. Descriptive statistics specifically frequency distribution and simple percentage were used for data analysis.

Result and Discussion

Skills and Competences Possessed by ICT Staff in ABU, Zaria

Table 1: Skills and Competences Possessed by ICT Staff

S/N	Skills and Competences	Frequency	Percentage (%)
1.	Cybersecurity Knowledge	42	71.2
2.	Database Management	51	86.4
3.	Network Administration	52	88.1
4.	Web Development and Maintenance	47	79.7
5.	Incident Response and Management	33	55.9
6.	Data Encryption and Privacy Protection	52	88.1
7.	Access Control Management	48	81.4
8.	Problem-Solving and Analytical Thinking	50	84.7
9.	Software Updates and Patch Management	52	88.1
10.	User Support	53	89.8
11.	Compliance and Regulatory Knowledge	46	78.0
12.	Project Management	27	45.8

Source: Field Survey (2024)

The Table 1 showed the skills and competences possessed by ICT Staff for handling of portal in Ahmadu Bello University, Zaria and the Table revealed that, user support has the highest frequency and percentage of 53(89.8%), closely followed by Network administration, data encryption and privacy and software updates and patch management with 52(88.1%) each, then, database management with 51(86.4), followed by problem solving and analytical thinking with 50(84.7%), followed by access control management 48(81.4%), then Web Development and Maintenance 47(79.7%), followed by compliance and regulatory knowledge with a frequency and percentage of 46(78.0%), then, cybersecurity knowledge with 42(71.2%), followed by incidence response and management with 33(55.9%), then, project management with 27(45.8%).

From the interpretation and it was found out that, user support is the most possessed skill and competence by ICT staff for handling portal in ABU, Zaria because it has the highest frequency and percentage of 53(89.8%). Whilst, project management is the least skill and competence possessed by ICT staff for handling portal in ABU, Zaria because it has the least frequency and percentage of 27(45.8%). The findings indicate that user support is the most possessed skill among ICT staff handling the university portal at Ahmadu Bello University, Zaria. On the other hand, project management is the least possessed skill among ICT staff. This could be due to the fact that ICT personnel are primarily focused on operational and technical tasks rather than long-term strategic planning and execution of large-scale projects.

This finding is contrary to the finding of Njoku (2019), Adeniran and Obimakinde (2020) and Aaltola (2022) who discovered that database management skills and network administration are the basic skills and competences possessed by all website administrators.

Barriers encountered by ICT Staff in Adopting Cybercrime Management Techniques

Table 2: Challenges encountered by ICT Staff in Adopting Cybercrime Management Techniques

S/N	Challenges	Frequency	Percentage (%)
1.	Cybersecurity Threats	51	86.4
2.	Data Privacy and Compliance	49	83.1

3.	System Downtime and Reliability	56	94.9
4.	User Authentication Issues	46	78.0
5.	Scalability	31	52.5
6.	Software Bugs and Technical Glitches	54	91.5
7.	Integration with Other Systems	54	91.5
8.	User Resistance and Low Adoption	38	64.4
9.	Limited Technical Expertise	52	88.1
10.	Data Backup and Recovery	52	88.1
11.	Performance Optimization	34	57.6
12.	Inadequate Funding/Budget Constraints	56	94.9
13.	Lack of Technical Support and Training	47	79.7
14.	Continuous Maintenance and Updates	44	74.6

Source: Field Survey (2024)

Table 2 showed the challenges encountered by ICT Staff of Ahmadu Bello University, Zaria in adopting cybercrime management techniques for handling of portal and the Table revealed that; system downtime and reliability; and funding and budget constraints have the highest frequency and percentage of 56(94.9%) each, then followed by software bugs and technical glitches with 54(91.5%) each, followed by limited technical expertise and data backup and recovery with 52(88.1%) each, followed by cybersecurity threats with 51(86.4%), followed by data privacy and compliance with 49(83.1%), technical support and training with 47(79.7%), then, user authentication issues with 46(78.0%), followed by continuous maintenance and updates with 44(74.6%), followed by user resistance and low adoption with 38(64.4%), followed by performance optimization with 34(57.6%), and lastly scalability with 31(52.5%).

It can be inferred that, system downtime and reliability; and funding and budget constraints are the main challenges encountered by ICT Staff of Ahmadu Bello University, Zaria in adopting cybercrime management techniques for handling of portal, because they have the highest frequency and percentage of 56(94.9%) each. Whilst, scalability has the least frequency and percentage of 31(52.5%) and so it is considered as uncommon challenges encountered by ICT Staff of Ahmadu Bello University, Zaria in adopting cybercrime management techniques for handling of portal. The findings indicate that system downtime and reliability, along with funding and budget constraints, are the most significant challenges faced by ICT staff at Ahmadu Bello University, Zaria in adopting cybercrime management techniques for the university portal. On the other hand, scalability is considered a less common challenge, which suggests that the current security solutions are adequate for the existing scale of operations. This could mean that the university has not yet faced significant growth in user base or data volume that would necessitate scalable cybersecurity solutions.

This finding aligns with the discovery of Ajayi (2016) and Taher et al (2020) who found out that budget constraints and software bugs and technical glitches are the main deterrent of adopting and proper utilization of cybersecurity management techniques for effective and efficient use.

Conclusion and Recommendations

This study at Ahmadu Bello University, Zaria highlights that ICT personnel are well-versed in user support helpdesk responsiveness, training, and troubleshooting which plays a key role in maintaining portal operations. However, these competencies align more with operational support than with proactive cybersecurity management and sophisticated incident response, revealing important skill gaps in technical security capacities. Infrastructure issues, notably frequent system downtime and unreliable performance, further exacerbate these vulnerabilities. Such instability impairs continuous security monitoring, disrupts automated defenses, and diminishes overall protection of portal systems. These challenges are compounded by limited budgets and funding, which hinder procurement of advanced security tools, specialized training, and essential infrastructure upgrades. Conclusively, the study emphasizes the need for a holistic cybersecurity strategy that addresses both people and systems. Beyond enhancing user support, it advocates for targeted technical training, stronger infrastructure resilience, and adaptable budget strategies such as risk-informed resource allocation and implementation of standards like ISO/IEC 27001. The study provided the following recommendations based on the findings: that the university's ICT department, in partnership with the human resources unit, should initiate professional development programs to improve project management skills among ICT staff. This can be achieved through sponsored training, certification courses, and mentorship programs led by experienced project managers. Furthermore, hands-on project assignments and team-based collaborations should be introduced to help ICT staff apply project management principles in real-world scenarios. The university management should allocate dedicated funding for cybersecurity infrastructure and maintenance to minimize system downtime and enhance reliability which can be achieved by securing external grants, forming partnerships with technology firms, and integrating cybersecurity investments into the university's annual budget, also the ICT department should implement backup and redundancy measures, such as cloud-based storage and failover systems, to ensure continuous portal accessibility. Moreover, regular maintenance schedules and system performance evaluations should also be conducted to prevent unexpected downtimes.

References

Adeleke, A. O., & Nwankpa, J. K. (2019). Infrastructure reliability and cybersecurity vulnerabilities in Nigerian higher education institutions. *Journal of Information Security in Developing Countries*, 15(3), 234-248.

Ajayi, O. B., & Hussin, H. (2018). Comparative analysis of cybersecurity frameworks implementation in West African universities. *International Journal of Cyber Security and Digital Forensics*, 7(2), 156-171.

Aloul, F. A. (2012). The need for effective information security awareness. *Journal of Advances in Information Technology*, 3(3), 176-183.

Edu, A. S., & Ofem, U. E. (2020). Cybersecurity challenges in Nigerian educational institutions: A systematic review. *African Journal of Information Systems*, 12(4), 89-105.

Furnell, S., & Clarke, N. (2012). Power to the people? The evolving recognition of human aspects of security. *Computers & Security*, 31(8), 983-988.

National Cybersecurity Policy and Strategy. (2021). Federal Ministry of Communications and Digital Economy, Nigeria.

Okafor, C. C., & Aigbavboa, C. O. (2019). Cybersecurity implementation challenges in developing nations: Evidence from Nigerian universities. *Technological Forecasting and Social Change*, 149, 119761.

Onwubiko, C., & Ouazzane, K. (2021). Resource constraints and cybersecurity capacity in West African academic institutions. *Computers & Security*, 108, 102345.

Soomro, Z. A., Shah, M. H., & Ahmed, J. (2016). Information security management needs more holistic approach: A literature review. *International Journal of Information Management*, 36(2), 215-225.

Taher, A., Abdullah, M., & Jahan, I. (2020). Challenges of Cyber Policing in Response of Cybercrime to Reduce Victimization. *International Journal of Research and Innovation In Social Science (IJRISS).* IV(V), 2454–6186. www.rsisinternational.org

Tawalbeh, L., Muheidat, F., Tawalbeh, M., & Quwaider, M. (2020). IoT privacy and security: Challenges and solutions. *Applied Sciences*, 10(12), 4102.

Tientcheu, P. P. (2021). *Security Awareness Strategies Used in the Prevention of Cybercrimes by Cybercriminals* [Walden University]. https://www.proquest.com/openview/de56b311b5e001459e318a1cc92aecd1/1?pq-origsite=gscholar&cbl=18750&diss=y

Uche, J., Nwankwo, P., & Akpan, I. (2022). Financial constraints and the impact on cybersecurity infrastructure in Nigerian higher institutions. *Journal of Higher Education Security, 15*(2), 123-140.

USE OF DIGITAL DATABASE LIBRARY RESOURCES AND RESEARCH PRODUCTIVITY OF LIBRARIANS IN PUBLIC UNIVERSITIES IN DELTA AND EDO STATES, NIGERIA

Peace Nkemdilim, Ideh
Federal Polytechnic Orogun, Delta State.

Prof. Esoswo Francisca Ogbomo,
Delta State University, Abraka.

Abstract

This study investigated the use of digital database library resources and research productivity of librarians in universities in Delta and Edo States, Nigeria. The research employed a descriptive survey design. The entire 125 librarians in public universities in Delta and Edo States, Nigeria formed the population of the study. A questionnaire was used as the instrument of data collection. The data generated through the questionnaire were analyzed using descriptive and inferential statistics. The study found that even though librarians used library digital database resources, particularly e-journals and conference proceedings, their overall research productivity was low, with limited productivity in areas such as monographs, book chapters, and patents. The major identified challenges to research productivity of the librarians include low internet bandwidth, difficulty reading on screens, and information volatility. The study found a significant relationship between the use of library digital database resource and research productivity of librarians, indicating that effective utilisation of the resources enhanced research productivity of librarians. The study recommends improved infrastructure, professional training, and institutional incentives to enhance research productivity of librarians.

Keywords: Database Resources, Delta and Edo States, Digital Library Librarians, Research productivity, Public Universities, Use

Introduction

Across the nations of the world, including Britain, France and Nigeria, librarians in universities are accorded academic status. The status puts them on par with teaching faculty in terms of some academic rights which include tenure, promotion opportunities, and the expectations for research and publishing (Ogbomo & Adekoya, 2019). Faculty status affirms the role of librarians as integral contributors to academic teaching and research (Weng & Murray, 2020). As academics, librarians are expected not just to support teaching and research but likewise to involve in scholarly activities such as conducting original research, publishing their findings, and contributing to the global body of knowledge (Borrego et al., 2018). More so, institutional expectations for academic librarians in the 21st century accentuate research productivity as a vital component of their professional roles (Mandal & Dasgupta, 2019). Research productivity is the totality of textbooks, technical reports, monographs, conference proceedings, journal articles, theses, dissertations, co-authored textbooks, and patents produced by an individual librarian (Simisaye & Popoola, 2019).

In the modern era of technology, there is a necessity for librarians in Nigerian universities to use digital library database resources for their research productivity. This is because the research productivity of librarians depends vastly on the extent they can harness the digital database library resources in their research efforts (Ideh & Ekoko, 2023; Adekoya, 2020). Digital library database resources refer to electronic scholarly materials such as e-journals, e-books, online articles, and multimedia which are accessible online for research and other academic purposes (Rafi et al., 2019). These resources are crucial for enhancing the research productivity of librarians. They provide access to scholarly materials such as journals, e-books, conference proceedings, and other academic publications (Bhardwaj & Sharma, 2015). Digital library database resources enable librarians to be conversant with new trends in librarianship, and also conduct groundbreaking research with reliable information (Calhoun, 2014). Also, the resources usually provide advanced search tools, citation management features, and collaborative platforms that simplify the research process. Librarians can leverage the resources to produce high-quality research more proficiently, make significant contribution to academic discourse, and meet the institutional expectations for research productivity (Rafi et al., 2019).

Academic libraries in Nigeria, including those in Delta and Edo States, subscribe to relevant digital library databases that provide vital resources for research. However, studies have shown that research productivity among librarians in Nigerian universities remains significantly low (Idoko et al., 2024; Ogbomo & Adekoya, 2019). This may be due to the inadequate use of these digital resources. Meanwhile, no empirical study has explicitly examined how the use of digital library databases influences research productivity among librarians in universities within Delta and Edo States. This study, therefore, investigates the relationship between the use of digital library databases and the research productivity of librarians in universities in these states. It explores the types of databases used, the extent of their utilisation, the level of research productivity, and the challenges faced in using these resources for research.

Statement of the Problem

Digital database resources support teaching and research in universities in ensuring effectiveness and ground-breaking research among librarians depends on the use of reliable and quality information resources such as journal articles, textbooks, conference proceedings, etc. (Salman et al., 2020). Some university libraries in Delta and Edo States do not subscribe to essential databases, which limits librarians' access to relevant research materials. Even where digital resources are available, factors such as inadequate training, limited awareness, poor infrastructure, and low digital literacy may hinder effective utilisation. Despite these issues, no empirical research has specifically examined how the use or underuse of digital library database resources affects the research productivity of librarians in universities in Delta and Edo States. This study, therefore, seeks to fill this gap by investigating the use of digital library database resources and the research productivity of librarians in in universities in Delta and Edo States. The study examines the digital databases used by the librarians, the extent of utilization of the resources for research, the level of research productivity among the librarians, and the challenges the librarians face when using the resources for research.

Research Questions

The following research questions guided the study:

1. What digital databases do librarians in Public Universities in Delta and Edo States use for their research?
2. To what extent have librarians in Public Universities in Delta and Edo States utilized digital database resources for research in the last five years?
3. What is the level of research productivity among librarians in Public Universities in Delta and Edo States?
4. What challenges do librarians in Public Universities in Delta and Edo States face when using digital database resources for research?

Hypothesis

There is no significant relationship between the use of digital library database resources and research productivity of librarians in universities in Delta and Edo States.

Literature Review

Digital databases refer to planned and organised collections of electronic resources such as journal articles, e-theses, e-books, conference proceedings, and other scholarly materials. Tella et al. (2018) defined digital databases as a collection of computerised information records comprising organised pieces of information placed in records. The databases are categorised subject to their functions. The databases are created to support effective information retrieval, organisation, and dissemination. Digital databases are supported by philosophies of information organisation, knowledge management, and user-centered access. This enables timely and efficient retrieval of quality materials by users such as librarians, researchers, and students. The utility of digital databases is determined by their ability to bridge the gap between information availability and information accessibility, mostly within academic environments where the quantity and complexity of research resources are persistently increasing.

Digital technologies have substituted the conventional mode of delivering information. Due to this, several databases have emerged in the contemporary websites of academic libraries. Library digital database resources include academic journal databases **(**JSTOR, ScienceDirect, SpringerLink, Wiley Online Library), e-book databases (ProQuest Ebook Central, EBSCO eBooks, Google Books, Project Gutenberg), newspaper and magazine databases, multimedia databases, statistical and data repositories, and legal and government document databases. These databases vary based on their purposes and the clientele they serve (Gonzalez, 2021). Digital database resources support teaching and research in universities. The Digital Public Library of America (DPLA), for instance, is a free online platform that collects information resources from libraries across the United States, and offer access to an extensive array of resources, such as photographs, manuscripts, and books (Smith, 2018). Broadly recognized digital library databases such as ScienceDirect, AGORA, and DOAJ significantly support research productivity across various academic fields. These resources encompass bibliographic databases, full-text databases, citation databases, and institutional repositories, each playing a distinct role in the research process.

The relevance of digital library database resources has been documented in the literature. Olarongbe and Ibrahim (2017) posited that database resources enhance the research productivity of librarians by providing access to vast, credible, and up-to-date scholarly materials across

disciplines. Also, some bibliographic databases index a wide range of scholarly articles, reports, and conference papers, which help librarians discover relevant literature and stay informed about developments in the field (Okunoye, 2020). Full-text databases such as **JSTOR,** and **ScienceDirect** give access to journal articles, e-books, and theses which enables librarians to carry out groundbreaking research (Kore & Samuel, 2024). Citation databases which include **Scopus** and **Web of Science** track research trends, evaluate the impact of articles, and identify prominent writers and publications (Lawal, 2021). This is a valuable tool for librarians who want to enhance their personal scholarly visibility.

Librarians as well as lecturers in various faculties depend on information resources in the digital databases of their institutional libraries for research (Owoicho & Adekoya, 2021). The databases offer treasured resources and information to support librarians in their research activities. The increase in online journals has expanded librarians' access to digital database resources for research (Gonzalez, 2021). However, librarians face several challenges in making effective use of these resources. This has greatly impacted the quality and efficiency of their research. Smith (2018) noted that some librarians struggle with navigating digital databases due to complex interfaces and advanced search functionalities. This difficulty hinders their ability to locate relevant information. Olarongbe and Ibrahim (2017) identified challenges such as inconsistent power supply, limited online access, lack of technical skills, preference for general search engines like Google, poor downloading speeds, inadequate ICT infrastructure, low awareness of available resources, and a general aversion to reading from screens.

The wave of technological advancement requires that librarians are information literate. Meanwhile, some librarians lack the required information literacy skills needed in their research efforts. This makes it difficult for them to carry out effective research and efficiently appraise information sources and resources (Miller, 2015). More so, technical problems like database downtime and slow loading speeds can upset research workflow of librarians (Roberts, 2018). Williams (2018) claimed that library budget constraints are the major obstacles in subscribing to different journal databases or e-books. Lack of training in the use of digital library database resources is a difficult issue for librarians (Rafi et al., 2019).

Research is a crucial way of seeking a panacea to social and economic problems. Thus, research is among the mandates of academics in universities. Nations across the globe depend on the research findings that emanate from universities and research institutes to solve economic, political, and developmental challenges. Research entails a cautious investigation of an issue to realize new information or facts concerning a difficulty to provide answer (Adekoya, 2018). Research is the foundation of growth; scarcely can any country achieve development without giving research precedence. Research offers a basis for producing knowledge for global and societal development (Oduwole, 2014).

Promotion and career advancement of librarians depend on their research productivity (Ogbomo & Adekoya, 2019). Research productivity entails learned contributions, presentations, and other types of research publications. Research productivity comprises different areas of professional engagement in research activities (Harer, 2016). Research productivity refers to the outcome of research that can be published or unpublished (Okonedo et al., 2015). Cadez et al.

(2017) referred to research productivity as the overall quantity of research generated, notwithstanding its value. Research productivity is the quality and quantity of research published locally and internationally as textbooks, chapters in books, journal articles, conference/workshop proceedings, occasional papers, monographs, edited books, bibliographies, abstracts, and indexes (Babalola & Umar, 2021).

Effective and ground-breaking research among librarians depends on the use of reliable and quality information resources such as journal articles, textbooks, conference proceedings, etc. (Salman et al., 2020). Research productivity is an essential consideration for appointing and promoting librarians. Librarians are promoted from one position to the other based on their scholarly publications and community service (Ogbomo & Adekoya, 2019). Due to the huge importance placed on research productivity, higher educational institutions across the globe are rated based on the level of research productivity of their academic staff. Based on this, universities specify in their condition of service the needed quantity of publications for the promotion of academics. The number of publications differs with diverse academic positions in the institutions.

The advancement in technology enables the use of digital database library resources for research. Academic libraries all over the globe are spending a vast amount on database subscriptions to speed up research among their academic staff (Rafi et al., 2019). The effort has yielded monumental result as the use of digital resources has greatly increased the research productivity of staff, including librarians (Ani et al., 2015). The bulk of the information resources needed for research are found in the library's digital databases (Gonzalez, 2021). ERIC for instance (EBSCOhost) owned by Elton B. Stephen is a broadly utilized digital library database that plays an essential role in scholarly research, mostly for librarians. Increased access to relevant digital resources enhances research productivity of librarians (Kore, & Samuel, 2024). According to Brown (2021), effective use of digital databases supports personal academic growth of librarians.

There has been an enhancement in the use of digital database resources among researchers due to the belief that the resources are more dependable than the content of the open web (Rafi et al., 2019). Olalla-Soler (2018) averred that the outburst of database-related information causes the search for information to be highly effective. As such, librarians prefer database resources for their research. Salman et al. (2020) explored the availability, accessibility, and usage of electronic information resources among academic staff of Fountain University Library, Osogbo. A descriptive survey research design was used for the study. The study found that OPAC, EBSCOHost, Research4Life, ScienceDirect, and e-resources (textbooks and journals) were the databases used for research in the library. It was also discovered that the available electronic information resources, though accessible, were not sufficient for satisfactory usage by the respondents.

Methodology

The research employed a descriptive research design. This is because the study described the way librarians in Delta and Edo States employed digital library database resources for their research productivity. The population of the study was 125 full-time practicing academic librarians from the eight government-owned universities in Delta and Edo States, Nigeria, who required research publications for career advancement. A total enumeration sampling technique was

employed for the study. The manageable size of the study informed the consideration of the entire population as the sample size. A questionnaire was used as the instrument of data collection. The questionnaire was validated by a lecturer of measurement and evaluation at the University of Benin and a principal librarian at the Western Delta University Oghara. To ascertain the level of reliability of the instrument, Cronbach's alpha reliability test technique was used. Twenty copies of the questionnaire were administered to librarians at the University of Nigeria, Nsukka. The test obtained a reliability index of 0.63 which was sufficient for the study as the standard level for reliability test is 0.6 and above (Nworgu, 2015). The data generated through the questionnaire were analysed using descriptive and inferential statistics. Mean and standard deviation were used for the research questions. Pearson's Product Moment Correlation Coefficient was used to test the hypothesis at a 0.05 level of significance.

Result and Discussion

RQ1: What digital databases do librarians in universities in Delta and Edo States use for their research?

Table 1: Library Digital Databases Used for Research by Librarians

Databases	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean ($\bar{x}$)	Std Dev.
EBSCOhost	26	45	0	4	4	4.08	.997
Directory of Open Access Journals	17	49	6	5	2	3.94	.882
Directory of Open Access Books	15	46	3	13	2	3.75	1.031
Science Direct	13	43	6	8	9	3.54	1.217
AJOL	12	42	10	6	9	3.53	1.186
ARDI	14	22	2	25	16	2.91	1.461
TEEAL	15	17	3	24	20	2.78	1.508
OARE	7	17	10	30	15	2.63	1.263
HINARI	5	14	9	19	32	2.25	1.325
AGORA	1	5	14	33	26	2.01	.940
OAPEN	0	3	4	41	31	1.73	.729
Average Mean						3.01	

Table 1 presents data on digital databases librarians in universities in Delta and Edo States use for their research. The average mean is 3.01. This means that the respondents agree that they use the databases. While the respondents agree that they used databases such as EBSCOhost ($\bar{x}$=4.08, SD=0.997), Directory of Open Access Journals ($\bar{x}$=3.94, SD=0.882), and Directory of Open Access Books ($\bar{x}$=3.75, SD=1.031), they disagree using HINARI ($\bar{x}$=2.25, SD=1.325), AGORA ($\bar{x}$=2.01, SD=0.940), and OAPEN ($\bar{x}$=1.73, SD=0.729). The average mean **($\bar{x}$=3.01) is above the criterion mean of 2.50.** This implies that librarians use the databases for research. However, the low use of HINARI, AGORA and OAPEN may possibly be because they are not pertain to librarianship.

RQ2: To what extent have librarians in universities in Delta and Edo States utilized library digital database resources for research in the last five years?

Table 2: Extent of Using Library Digital Database Resources for Research by Librarians

Digital Database Library Resources	Very High Extent	High Extent	Moderate Extent	Low Extent	Very Low Extent	Mean ($\bar{x}$)	Std Dev.
E-journals	33	23	19	4	0	4.08	.931
e-Conference proceedings	25	28	13	9	4	3.77	1.165
E-dissertations and theses	20	19	16	16	8	3.34	1.329
e-Technical reports	13	20	22	14	10	3.15	1.262
E- reference resources	14	17	17	14	17	2.96	1.409
E-books	18	11	12	18	20	2.86	1.517
E-Bibliographies	4	10	25	14	26	2.39	1.213
e-seminar Papers	2	12	17	18	30	2.22	1.184
E-Archive	1	5	26	18	29	2.13	1.030
e-Newsletters	3	5	18	23	30	2.09	1.100
Audio & Visual Resources	0	9	13	29	28	2.04	.993
e-Grey documents	0	2	3	12	62	1.30	.667
Average Mean						**2.69**	

As revealed in Table 2, the average mean is 2.69. This indicates a high extent of using digital library database resources for research by librarians in universities in Delta and Edo States. However, the extent of using resources such as s-bibliographies ($\bar{x}$=2.39), e-seminar papers ($\bar{x}$=2.22), e-archive ($\bar{x}$=2.13), e-newsletters ($\bar{x}$=2.09), audio and visual resources ($\bar{x}$=2.04), and e-grey literature ($\bar{x}$=1.30) is low. The high use of databases implies that the librarians are actively engaging with digital resources for academic inquiry and enhance information accessibility.

RQ3: What is the level of research productivity among librarians in universities in Delta and Edo States?

Table 3: Extent of Research Productivity of Librarians in Universities in Delta and Edo States in the last five years

Research Productivity	13 and above Very High Extent	10-12 High Extent	7-9 Moderate Extent	4-6 Low Extent	0-3 Very Low Extent	Mean ($\bar{x}$)	Std Dev.
Journals articles	54	13	11	0	1	4.51	.830
Conference/Seminar/Workshops papers	16	22	20	16	5	3.35	1.199
Working papers	6	11	18	33	11	2.59	1.127
Occasional papers	6	13	14	27	19	2.49	1.239
Technical reports	4	15	17	21	22	2.47	1.228
Monographs	0	0	4	51	24	1.75	.542

Book chapters	0	0	8	26	45	1.53	.676
Textbooks	0	0	0	8	71	1.10	.304
Scientific peer-reviewed bulletins	0	0	0	1	78	1.01	.113
Co- authored textbooks	0	0	0	0	79	1.00	.000
Patent and Certified Invention	0	0	0	0	79	1.00	.000
Average Mean						**2.07**	

Table 3 shows that the average mean score ($\bar{x}$ = 2.07) is less than 2.50. This indicates a low extent of research productivity among librarians in in universities in Delta and Edo States in the last five years. However, journal articles ($\bar{x}$ = 4.51), conference/seminar/workshop papers ($\bar{x}$ = 3.35), and working papers ($\bar{x}$ = 2.59) show high extents of productivity, while other research outputs are low. This implies that while the librarians are moderately productive in the areas of journal articles and participation in conferences, their overall research output across diverse formats is limited. This suggests a need for institutional support or capacity-building to increase their research engagement.

RQ4: What challenges do librarians in universities in Delta and Edo States face when using digital database resources for research?

Table 4: Challenges Encountered by Librarians in Universities in Delta and Edo States in Using Digital Database Library Resources for Research

Challenges	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Mean ($\bar{x}$)**	**Std Dev.**
Low internet bandwidth	22	51	1	5	0	4.14	.729
Difficulty in reading on computer screens	17	28	3	25	6	3.32	1.326
Volatility of information	15	26	7	29	2	3.29	1.221
Encryption of information	13	28	4	30	4	3.20	1.255
Lack of adequate knowledge of different application software	9	24	1	13	32	2.56	1.542
Difficulty in identifying relevant information to meet information needs	4	18	9	31	17	2.51	1.208
Information overload	7	24	3	12	33	2.49	1.501
Lack of awareness of digital database library resources	2	14	17	26	20	2.39	1.126
Insufficient e-resources in library and information science	8	19	6	9	37	2.39	1.514
Complexities in searching and retrieval	1	8	24	16	30	2.16	1.091
Lack of digital skills	0	13	12	22	32	2.08	1.107
Average Mean						**2.78**	

Table 4 shows the challenges encountered by librarians in universities in Delta and Edo States using library digital database resources for research. While the respondents agree that they encountered such as low internet bandwidth (=4.14, SD=0.729), difficulty in reading on computer screens (=3.32, SD=1.326), and Volatility of information (=3.29, SD=1.221), they disagree that lack of awareness of digital database library resources (=2.39, SD=1.126), insufficient e-resources in library and information science (=2.39, 1.514), complexities in searching and retrieval (=2.16, SD=1.091, and lack of digital skills (=2.08, SD=1.107) are encountyered. with the average mean of 2.78, it means that the librarians encounter a lot of challenges using digital databases for research. This implies that the librarians will not be able to do effective research using the databases, which portends danger for scholarship.

Hypothesis: There is no significant relationship between the use of digital database library resources and research productivity of librarians in universities in Delta and Edo States, Nigeria

Table 5: Relationship between the use of digital database library resources and research productivity of librarians in universities in Delta and Edo States, Nigeria

		Use of digital database library resources	Research productivity
Use of digital database library resources	Pearson Correlation	1	.377
	Sig. (2-tailed)		.000
	N	79	79
Research productivity	Pearson Correlation	.377	1
	Sig. (2-tailed)	.000	
	N	79	79

From Table 5, Pearson correlation coefficient r (=0.377). The correlation coefficient r value of 0.377 translates to 38%, which implies a moderate correlation. Since the significant value (Sig.2-tailed) is 0.000 (which is less than 0.05), it can be concluded that there is a significant relationship between the use of digital database library resources and research productivity of librarians in universities in Delta and Edo States, Nigeria. The null hypothesis is therefore rejected implying that an increase/decrease in the use of digital database library resources may lead to a corresponding increase/decrease research productivity of the librarians.

Discussion

The use of library digital resources for research in the modern era represents a revolutionary breakthrough in the application of ICT. This study found that librarians in university libraries in Delta and Edo States used digital databases such as EBSCOhost, DOAJ, DOAB, ScienceDirect, and AJOL for their research. A high level of database usage was recorded among the librarians, however, their research productivity over the past five years was low. Challenges in using these databases included low internet bandwidth, difficulty reading on computer screens, and the volatility of information. The hypothesis tested found significant relationship between the use of digital databases and research productivity among the librarians.

The finding that the librarians make use of relevant databases for research indicates that they would produce high and quality research. This will also improve their access to current and high-quality, leading to more informed research output and enhanced academic contributions. This finding is in agreement with that of Igere (2020) who investigated the influence of electronic

information resources on the publication output of librarians in Niger Delta and Delta State University, Nigeria, and found that the librarians make maximum use of electronic resources for their research. A similar study by Ogbomo and Adekoya (2019) also found a high level of using database resources among librarians in South-west Nigeria. Most of the librarians in Nigeria enhance their research productivity using library database resources such as e-journals, e-books, and e-encyclopedia (Ani et al., 2014). This will enable the librarians to improve the quality and quantity of their research and compete with their counterparts in advanced countries.

The findings of this study indicate that the extent of research productivity of librarians in universities in Delta and Edo States in the last five years is low. Even though the librarians are productive in the areas of journal articles, and conference paper publication, they have not done enough in some other areas. This portends danger to research development in librarianship. A related study by Babalola (2014) who investigated the influence of job motivation, demographic and environmental factors on the productivity of librarians in colleges of education in Nigeria, found that most of librarians were not so productive in terms of research productivity. In contrary, the result of the study conducted by Okonedo et al. (2015) on correlational analysis of demographic factors, self-concept and research productivity of librarians in public universities in South-west, Nigeria revealed a high research productivity. These findings suggest the need for the librarians to roll up their sleeves and conduct groundbreaking research. Oduwole (2014) criticized librarians for their inability to produce high-quality research despite their access to relevant information resources.

The challenges encountered by the librarians in using digital database library resources for research include low Internet bandwidth, difficulty in reading on computer screens, and volatility of information. These challenges are similar to those academics in the faculty are facing. If mot addressed, such challenges can cause a perennial decline in research productivity. A study by Salman et al. (2020) found that lack of digital skills, and low Internet bandwidth affect research productivity of librarians in academic libraries. Equally, Ogbomo and Adekoya (2019) identified difficulty in identifying relevant information to meet my information needs, information overload complexities in searching and retrieval, and difficulty in reading on computer screens as major challenges to the use of database resources.

This study found a significant relationship between the use of digital database resources and research productivity of librarians in universities in the Delta and Edo States. This indicates that librarians that use the resources will produce a high level of research. This may be because the unhindered access to relevant digital resources needed for research. A related study by Rafi et al. (2019) found that the productivity of university research depends significantly on the use of standard databases. Also, a study by Ani et al. (2014) which sought to find out the effect of accessibility and utilization of electronic resources on the research output of academic staff in selected Nigerian universities found a significant positive correlation between accessibility and utilization of electronic resources and research output of the academic staff. The implication is that an enhancement in accessibility and utilization of electronic resources would increase the research output of the academic staff

Conclusion and Recommendations

This study investigated the use of library digital database resources and the research productivity of librarians in public universities in Delta and Edo States, Nigeria. The findings revealed that librarians utilized digital databases for research. Despite this, overall research productivity is low. Challenges such as low internet bandwidth, difficulty reading on screens, and volatility of online information significantly hinder effective database usage. Importantly, the study established a statistically significant positive relationship between the use of library digital databases and research productivity of librarians. This implies that increased use and improved access to digital resources could lead to higher levels of research output among academic librarians. Since knowledge and research production are vital to the promotion and career advancement of librarians, there is a need for librarians to to leverage database resources to advance their research productivity.

Based on the findings of this study, the following recommendations are made: University management should subscribe to relevant and up-to-date digital library databases that cover the library and information science discipline, to meet the specific research needs of librarians. Universities should be exceptional in initiating policies that prioritize research and innovative discoveries, entrench ICT in the university curriculum, and provide funding standards to fascinate librarians and other scholars to enhance their research productivity. Policies that reward research productivity such as grants, publication bonuses, or promotion incentives should be implemented to motivate librarians to engage in scholarly activities. Research support services such as research mentoring, collaborative research platforms, and awareness campaigns on underutilised resources should be organised by libraries to enhance research capacity of librarians.

References

Adekoya, C. O. (2020). Funding and ICT use as determinants of sustainable library development. *Covenant Journal of Library & Information Science, 3*(1), 32-49.

Adekoya, C. O. (2018). Research skills, ICT application and sustainable library development. *Library Philosophy and Practice.* https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=5131&context=libphilprac

Ani, O. E., Ngulube, P., & Onyancha, B. (2014). Effect of accessibility and utilization of electronic information resources on productivity of academic staff in selected Nigerian universities. *Science Research. 2*(6), 166-171. http://www.sciencepublishinggroup.com/j/sr

Ani, O. E., Ngulube, P., & Onyancha, B. (2015). Perceived effect of accessibility and utilization of electronic resources on productivity of academic staff in selected Nigerian universities. SAGEOpen, 5(4). 215824401560758.

Babalola Y. T., & Umar, M. Y. (2021). Influence of information literacy skills on research productivity of academic staff of federal universities in North-eastern Nigeria. *Library and Information Perspectives and Research, 3*(2), 12 – 22.

Babalola, G. A. (2014). Influence of job motivation, demographic and environmental factors on the productivity of librarians in colleges of education in Nigeria. *International Journal of Social Relevance and Concern, 2*(2).19-26.

Bhardwaj, M., & Sharma, S. (2015). Electronic resources for university library and its advantages. *International Journal of Research in Library Science, 1*(2), 1-11.

Borrego, Á., Ardanuy, J., & Urbano, C. (2018). Librarians as research partners: their contribution to the scholarly endeavour beyond library and information science. *The Journal of Academic Librarianship, 44*(5), 663-670.

Brown, A. (2021). Enhancing librarian research productivity with EBSCOhost. *Journal of Library Science, 45(*3), 212-225.

Cadez, S., Dimovski, V., & Groff, M. Z. (2017). Research, teaching and performance evaluation in academia: The salience of quality. *Studies in Higher Education, 42*(8), 21-28.

Calhoun, K. (2014). *Exploring digital libraries: foundations, practice, prospects*. Facet Publishing.

Gonzalez, C. (2021). Professional development and digital database utilization among librarians. *Journal of Information Science, 38*(2), 167-182.

Harer, C. M. (2016). Research as a catalyst for professional development in academic libraries. *Journal of Academic Librarianship, 42*(5), 569-576.

Ideh, P. N., & Ekoko. O. N. (2023). Information Literacy Competencies as a predictor of Research Productivity of Librarians in Universities in South-South, Nigeria. *International Journal of Knowledge Dissermination (IJKD), 5*(1), 89-102.

Idoko, F. A., Olise, F. N., & Anyaobi, G. (2024). Factors affecting library educators' research productivity in South-south Nigeria. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *13*(1), 345-360.

Igere, M. A. (2020). Influence of electronic information resources on publication output of librarians in Niger Delta and Delta State University, Nigeria. *Information and Knowledge Management, 20*(4), 41-47.

Kore, A. f., & Samuel, A. (2024). The usage of electronic databases in academic libraries in Ghana. The experience of Ghana Communication Technology University Library (GCTUL). *International Journal of Knowledge Content Development & Technology*, *14*(2), 07-27.

Lawal, M. T. (2021). Awareness, availability and utilization of databases among undergraduate students of Federal University of Agriculture Makurdi Benue State. *Library Philosophy and Practice*. digitalcommons.unl.edu/libphilprac.

Mandal, S., & Dasgupta, S. (2019). Changing role of academic librarians in 21st century: A literature review. *Pearl: A Journal of Library and Information Science*, *13*(1), 35-44.

Miller, P. (2015). *Teaching information literacy skills: Best practices*. *Journal of Academic Libraries, 21*(4), 312-325.

Nworgu, B. G. (2015). *Educational research: Basic issues and methodology (3rd ed*). Nsukka: University Trust Publishers.

Oduwole, A. A. (2014). Impact of internet use on agricultural research outputs in Nigeria universities of agriculture. *Library Hi-Tech News, 21*(6), 12-16.

Ogbomo, M. O., & Adekoya, C. O. (2019). Relationship between academic workload and librarians' research productivity in university libraries in South-west, Nigeria. African *Journal of Studies in Education, 14*(1), 69-78.

Okonedo, S., Popoola, S. O., Emmanuel, S. O., & Bamigboye, O. B. (2015). Correlational analysis of demographic factors, self-concept and research productivity of librarians in public universities in South-West, Nigeria. *International Journal of Library Science, 4*(3), 43-52.

Okunoye, O. O. (2020). Awareness, access and attitude of postgraduate students towards use of electronic databases in two academic libraries in South-West Nigeria. *Journal of Applied Information Science and Technology, 13*(1), 257-264.

Olalla-Soler, C. (2018). Using electronic information resources to solve cultural translation problems. *Journal of Documentation, 74*(6), 1293-1317.

Olarongbe, O., & Ibrahim, I. (2017). The use of electronic resources by academic staff at the University of Ibadan, Nigeria. *PNLA Quarterly, 5*(2), 16-22.

Owoicho, O. P., & Adekoya, C. O. (2021). Usage of institutional repositories among students of a specialized university in Nigeria. *NDJLIS - Niger Delta Journal of Library and Information Science, 2*(1), 80-89.

Rafi, M., JianMing, Z., & Ahmad, K. (2019). Evaluating the impact of digital library database resources on the productivity of academic research. *Information discovery and delivery, 47*(1), 42-52.

Roberts, E. (2018). Addressing technological challenges in academic libraries. *Digital Library Journal, 10*(3), 201-214.

Salman, A. A., Ahmed, A. O., Raheem, R. O., & Pelemo, G. D. (2020). Availability, Accessibility, and use of electronic information resources among undergraduate students in Fountain University Library, Osogbo. *Journal of Library and Information Sciences, 8*(1), 100-110.

Simisaye, A., & Popoola, S. O. (2019). Relationship between information literacy skills and research productivity of researchers in Nigeria, and the Mediating Role of Socio-Economic Factors. *Libres, 29*(1), 51-76.

Smith, A. (2018). *The role of digital databases in modern librarianship*. *Journal of Library Science, 42*(3), 245-259.

Tella, A., Orim, F., Dauda, M. I., & Suleiman, A. M. (2018). The use of electronic resources by academic staff at the university of Ilorin, Nigeria. *Education and Information Technologies, 23*(1). https://doi.10.1007/s10639-017-9577-2

Weng, C., & Murray, D. C. (2020). Faculty perceptions of librarians and library services: Exploring the impact of librarian faculty status and beyond. *The Journal of Academic Librarianship, 46*(5). https://libraryassessment.org/wp-content/uploads/2018/11/68-WengMurray-FacultyPerceptionsOfLibrarians.pdf

Williams, R. N. (2018). Future strategic considerations and development priorities for national museum libraries. *Journal of Documentation, 74*(6), 1204-1225.

INFLUENCE OF USER EDUCATION ON QUALITY SERVICE DELIVERY IN MEDICAL UNIVERSITY LIBRARIES IN PLATEAU AND NASARAWA STATES NIGERIA

Tyem, Abraham Istifanus
College of Education Gindiri Plateau State, Nigeria

Prof. V. E. Unegb
Department of IRM Babcock University

Prof. G. Alegbeleye
Department of IRM Babcock University

Abstract

The study investigated the influence of user education on quality service delivery in medical university libraries in Plateau and Nasarawa States, Nigeria. The objectives were to find out the level of quality service delivery to medical university library student and ascertain the extent of user education provided by medical university libraries in Plateau and Nasarawa States Nigeria Survey design adopted. Population comprised 3,761 medical students. Taro Yamani's formular was used on size of 361 students. Stratified random sampling technique was used. Structured and validated questionnaire was used. Cronbach's alpha reliability coefficients constructs ranged 0.71 to 0.92. The findings revealed that the library has their customer's best interests at heart, making extra efforts at meeting users' information needs via referral service and that virtual talk is high. The study concluded that user education promotes quality service delivery in medical university libraries in Plateau and Nasarawa States, Nigeria. The study therefore recommended that library management should strategize on how librarians can effectively deliver user education to users in the library. The importance of placing high priority on bibliographic instruction and virtual talks for medical students cannot be overstated. Understanding the knowledge to be gained can have a significant and positive impact on users' studies

Keywords: Influence Medical students, Medical university libraries, Quality service delivery, Services delivery, User education,

Introduction

Medical librarians serve institutions to meet the public's fundamental requirements, thereby assisting institutions in completing work procedures rendered in library services. Medical libraries are founded to assist and provide services to medical professionals, medical students, and other persons studying medicine. However, they cater to a specific interest group or population working in the medical industry or teaching in medical schools. These libraries were created to suit the informational service needs of the community and members of the organizations to which they belong. Ajayi et al. (2017) noted that the twenty-first century emphasizes specialized and knowledge-intensive services as a contributor to development; hence, special librarianship, to which medical libraries belong, can help Nigeria's health sector progress.

Quality service delivery means attending to and answering every user's question as accurately, completely, and as soon as possible (Sharma, 2001). Quality service delivery is seen as a strategic tool for positioning and achieving operational efficiency and enhancing performance. Adamu (2017) asserted that quality service delivery is seen as bridging the gap between user expectations and the actual service provided. However, according to Carvalho and Dominguez (2012), the primary characteristics defining the quality of library services are excellence, conformity to specifications, and the capacity to meet or exceed customer expectations. Quality service delivery is providing a specific product or service that fits the user's desire. (Edeole, 2019). Quality service delivery is the degree to which user requirements and expectations are met when asked for information resources. Agoh and Omekwu (2022) observed that quality service delivery is a set of mechanisms whose interactions affect the effectiveness of library and information services. However, for information to be delivered to everyone, a well-equipped library and well-packaged information services delivery are required by the library, especially in the case of medical university libraries (Akpan-Ataha, 2013; Edidiong et al., 2015). Quality service delivery refers to the work librarians do in the library to help answer each user's question and satisfy their general information needs. The work done by librarians includes abstracting information, interlibrary loans, user education services, etc

Quality service delivery helps communicate the holdings of the medical library resources as an institution performing to provide service to medical students. Therefore, delivering high-quality services is very significant because successful verbal and non-verbal communication exchange requires common willingness and logic to describe how well material services are provided to users of medical libraries, especially in Plateau and Nasarawa State University libraries. For this study, the provision of quality services in medical university libraries is operationally defined as the extent to which library users receive, understand, and benefit from the information and services provided (Jones, 2005; Sengupta et al., 2000). However, Parasurama et al. (1985) observed that consumer perceptions of service quality delivery can be influenced by a librarian's ability to satisfy users through proper communication of library holdings. The more interactive network we can build with our clients, who are leading experts in their respective domains of expertise and information needs, the more satisfied users are with our service. Therefore, librarians' communication with users about library holdings remains very key for any quality service delivery in medical university libraries.

Quality service delivery in an institution is targeted at knowing the solutions to users' problems and how to meet their needs. Librarians working in medical libraries should be familiar with all the information problems users' face when looking for information. It becomes less recognizable if their problem remains unsolved. Any quality service delivery in a medical library should have up-to-date equipment/facilities for users and library materials to classify their subjects for users, and the seating capacity of the library should be befitting and appreciative to users. A solution process is necessary for problem-solving in any library, especially the medical library. Therefore, offering users solutions to problems is seen as a response to issues bordering on their academics. Prabha et al. (2010) observed that workers who are not suited for their tasks would not be able to deliver quality service. Therefore, employing the correct employees will increase any organization's chances of success in providing solutions to clients' problems. It is critical to comprehend not just the requirements and desires of customers but also the responsibilities or duties of the employees (Prabha et al., 2010).

Quality service delivery to users can achieve the desire objectives in medical university libraries, whereby librarians possessing full literacy knowledge about the understanding of user education are thoroughly mastered to serve user library resources. However, for any quality service delivery, teaching about user education and service delivery to users makes libraries different from other service organizations in society. User education involves informing, advising, assisting, and training library users to identify, recognize, comprehend, and appropriately use library information resources to the advantage of the library users. Oyeyemi and Adayi (2022) described user education as being developed to inform and influence attitudes about library usage and, more importantly, to inspire their quest for knowledge about library resources, which is essential for the advancement of individuals, groups, and societies of learners. Nagaraju (2009) presented the idea of user education, which consists of educational programs created to provide library patrons with the confidence to find and use the information resources clients require in the library. To the scholar, the method covers the subject matter precisely, thoroughly, quickly, and efficiently. According to Nagaraju (2009), Shahi observed user education as an activity that raises users' awareness of the enormous value of information resources in day-to-day living and ignites their interest in seeking information materials as and when needed.

User education can be supported with predictors such as library orientation, library tour, bibliographic instruction, and virtual talk. These will be used to measure the influence and extent to which librarians in medical university libraries facilitate users' access to materials or resources. However, library orientation enables librarians provide an opportunity to introduce new students and other library users to the complexity of university information materials (Agyen, 2008; Bashorun et al., 2020). The literacy skills basis of library orientation helps librarians measure user education. Library orientation is a program designed to inform users about library resources, activities, and services offered in the library. Library tours. is seen as situation where users are taken around to be shown some basic research skills. Users take turns highlighting appropriate research materials.

In the case of bibliography instruction, users are informed to be abreast of all relevant information about repackaging their information. Saunders (2003) argued that the goal of instruction in bibliography is to prepare users to utilize libraries responsibly and independently. Bibliography instruction enables users to know the search materials in a particular subject area. It helps users understand the description of the physical organization of information resources. Bibliography instruction skills enable users to become familiar with the description of materials in the libraries. Virtual talks serve as key indicators for user education. It refers to any remote communication where computer-based connections are joined between two or more persons, and people integrate with various facets of daily life and rely on it. It forms a knowledge-sharing spread into the field of libraries, whereby users are educated.

Several studies have investigated variables related to this study, often in combination with other variables and in different contexts. However, to the best of the researcher's knowledge, none have examined the specific combination of variables in this study within the context of medical university libraries in Plateau and Nasarawa State, Nigeria. Therefore, the study aims to investigate

the influence of user education as a fundamental for quality service delivery in medical university libraries in Plateau and Nasarawa State, Nigeria.

Statement of the Problems

Quality service delivery is seen as librarians providing specific products or services that fit their users' needs. It is seen in terms of bridging the gap between user expectations and the actual service provider. Studies have indicated that libraries often fall short in delivering quality services, reflected in the limited demand from patrons for existing library services (Obiora et al., 2020) in medical libraries in Plateau and Nasarawa States, Nigeria. The low level of quality service delivery has been observed as an inconvenient environment in terms of library location and operation hours, obsolete equipment/facilities, and seating capacity of the library. Additionally, it includes being poorly attended to by individual clients, inadequate knowledge in responding to clients, lack of periodization to respond to user queries, and delivery of user requests as promised. Lack of inadequacies in types of resources, lack of usefulness of resources to medical students, the medical libraries in Plateau and Nasarawa States, Nigeria, face significant challenges in delivering quality services to their users, resulting in unmet user expectations, inadequate access to relevant information, and poor user satisfaction (Lujan & Armando, 2017). It may be because the low levels of quality service delivery to clients in medical university libraries in Plateau and Nasarawa States, Nigeria, could be solved through identified gap intervening independent variable.

User education has been identified as the tool for enhancing patrons' knowledge, skills, and abilities to use library resources and services efficiently. Librarians introduce and educate users to the complexity of university materials (Agyen, 2008; Bashorun et al., 2020). Though various studies have been conducted on the influences of literacy on quality service delivery, the researcher in this study was not aware of any studies carried out on the influence of users' education on quality service delivery to medical university libraries in Plateau and Nasarawa State, Nigeria. Despite the critical importance of user education in facilitating quality service delivery, a thorough examination of the literature revealed a surprising lack of research focused on the influence of this factor on medical university libraries in Plateau and Nasarawa States, Nigeria. This study aims to address this knowledge gap. It was against this background that this study investigates the influence of user education as a fundamental for quality service delivery in medical university libraries in Plateau and Nasarawa States, Nigeria.

Objective of the Study

The objectives are to:

1. find out the level of quality service delivery to medical university library students in Plateau and Nasarawa States Nigeria and
2. ascertain the extent of user education provided by medical university libraries influence quality service delivery in Plateau and Nasarawa States Nigeria;

Hypotheses

The research hypothesis was formulated and was tested at a 0.05 level of significance:

1. Ho1 User education has no significant influence on quality service delivery in medical university libraries in Plateau and Nasarawa States Nigeria;

Literature Review

Service quality delivery is seen as bridging the gap between user expectations and the actual service provided. In other words, service quality delivery is seen as a strategic tool for positioning and achieving operational efficiency and enhancing performance (Adamu, 2017). According to Edeole (2019), quality service "includes all bundles of services that the library provides to users to support and advance the objectives of the parent institution. Agoh and Omekwu (2021) considered quality service delivery as a set of mechanisms whose interactions affect the effectiveness of library and information services. Quality service delivery is a phenomenon that takes into account consumers' expectations and positive impressions of the services provided (Erkan et al., 2014; Kucukaltan, 2007).

Philip (2015). Oyeyemi and Adayi (2022) described library user education as being developed to inform and influence attitudes about library usage and, more importantly, to inspire their quest for knowledge, which is essential for the advancement of individuals and societies. Nagaraju (2009) says user education consists of educational programs created for patrons to give them the confidence to find and use the information required. Ejiroghene (2020) and Marshall et al. (2007) indicated that user education is library instruction programs run in the library that have the advantage of introducing learners to the physical space of the library as well as intangible goods.

Albert Bandura's social learning model and learning theory serve as the framework for the research of user education. Academics regarded Bandura as the originator of cognitive theory (Bandura, 2006). Learning is "a lasting change in human performance and learner's engagement with the environment" (Driscoll, 1994; Razieh et al., 2012).. Learning theories are conceptual frameworks that explain how knowledge is taken, processed, and remembered during learning. However, Muro and Jeffrey (2008) argued that the foundation of connectionist learning theories is that the learner is the only source of cumulative experience to address the issue. Undoubtedly, Bandura is the most renowned psychologist nowadays. His social learning theory has impacted a wide field of study, including psychotherapy, health sciences, social policy, libraries, and education. This theory is predicated on the notion that social interactions with other people provide opportunities to learn. People independently develop comparable behaviors by observing the behaviors of others through interface with one another. People assimilate and imitate the behavior of others after watching them, especially if the observed behavior is rewarding or the observational experience is positive. According to Bandura, imitation entails imitating through observed motor behaviors (Bandura, 1977). The relevance of the theory is anchored on users' education, information resources accessibility and quality service delivery in medical university libraries in Plateau and Nasarawa States

Criticisms of Social Learning Model and Learning Theory were observed as: Oversimplification. Critics argue that Bandura's theory oversimplifies the learning process, neglecting the complexity of human behavior and the role of other factors, such as emotions and cognition. Generalizability. The theory was primarily developed based on laboratory experiments, which may not accurately reflect real-world situations. Lack of clear boundaries. The theory's concepts, such as observation, imitation, and reinforcement, can be difficult to distinguish and measure. Too Focus on individual learning. The theory focuses primarily on individual learning, neglecting the role of social and cultural factors in shaping behavior. Neglect of power dynamics. Critics argue that the theory

neglects the role of power dynamics, such as social inequality and oppression, in shaping learning and behavior.

Methodology

A descriptive survey research design was adopted for this study. Descriptive research design aims to observe all variables and subjects at one point without manipulating or controlling the subjects. The total population of this study comprised 3,761 individuals in three medical university libraries in Plateau and Nasarawa States, Nigeria. Taro Yamane formular was used for to arrive at a sample size of 361. Stratified random sampling technique was used in selecting the respondents. Structured validated questionnaire was used for data collection and employing a five-style Likert scale table. The Cronbach alpha reliability coefficient for the constructs ranged from 0.71 to 0.92, indicating that the instrument is highly reliable for data collection. A total of 336 returned questionnaires represented a response rate of 93%. Data collected from the research instrument were analyzed using Statistical Package for Social Sciences (SPSS) version 23 was used to analyze coded data responses, generating from inferential statistics. Descriptive statistics including percentages, mean and standard deviation were used and hypotheses were subjected to inferential statistics using single linear and multiple regression analyses.

Results and Discussion

Research question 1: What is the level of quality service delivery to medical university libraries students in Plateau and Nasarawa States, Nigeria?

Table: 1

Analysis of Research question one. Level of quality service delivery (Student's perception)

Quality Service Delivery Indicate the level of quality services provided to you by librarians	**Very High Level (%)**	**High Level (%)**	**Moderate level (%)**	**Low Level (%)**	**Very Low Level (%)**	**Mean**	**SD**
Reliability (REL)						**4.03**	.654
Speedily correcting wrongly posted users' information	86(25.7)	182(54.3)	67(20)	--	--	4.06	.674
Treating user's information needs promptly	68(20.3)	212(63.3)	54(16.1)	1(3)	--	4.03	.613
Providing sufficient users information resources	74(22.1)	193(57.6)	68(20.3)	--	--	4.02	652
Providing error-free information to users	59(17.6)	225(67.2)	51(15.2)	--	--	4.02	.573
Delivering user requests as promised is done to a	70(20.9)	191(57.0)	74(22.1)	--	--	3.99	.657
Tangibility (TAN)						**3.86**	.644
The seating capacity of the library is befitting and appreciative to users to a	65(19.4)	185(55,2)	85(25.4)	-	-	3.94	.667
Up-to-date equipment/facilities for users are to	55(16.4)	192(57.3)	86(25.7)	2(.6)	-	3.90	.660

Library materials are well classified by their subjects for users to a	28(8.4)	192(57.3)	114(34.0)	1(.3)	-	3.74	.607
Empathy (EMP)						**3.86**	**.642**
The library has their customer's best interests at heart	61(18.2)	210(62.7)	64(19.1)	-	-	3.99	.612
Making extra efforts at meeting users' information needs via referral service is to a	64(19.1)	196(58.5)	75(22.4)	-	-	3.94	.644
The understanding of specific needs of its customers and providing users with exact information to a	63(18.8)	190(56.7)	82(24.5)	-	-	3.94	.656
The level to which library staff gives attention to individual clients in the provision of crucial information is to a	64(19.1)	184(54.9)	87(26.0)	-	-	2.93	.669
knowledge displayed in answering all client's questions by the staff of the library is to a	3(9)	173(51.6)	138(41.2)	21(6.3)	-	3.47	.627
Responsiveness (RES)						**3.74**	**.715**
Librarian priority to respond users queries is to a	62(18.5)	179(53.4)	94(28.1)	--	--	3.90	.677
Not too busy to respond users request is to	61(18.2)	169(50.4)	105(31.3)	--	---	3.87	.693
Acceptance to prompt request within a time frame service to users is to a	58(17.3)	161(48.1)	82(24.5)	34(10.1)	--	3.73	.873
The willingness to help users is to a	1(.3)	177(52.8)	135(40.3)	22(6.6)	--	3.47	.622
Convenient Environment (CE)						**3.61**	**.645**
Convenience to library location is to a	36(10.7)	193(57.6)	105(31.3)	1(.3)	--	3;79	624
Convenience of the operation hours by librarian is to	10(3)	181(54)	143(42.7)	1(.3)		3.60	.554
The convenience to use of the facilities (both physically and online) is to a	14(4.2)	157(46.9)	123(36.7)	41(12.2)		3.43	.758
Overall Mean						**3.84**	**.655**

Source: Researcher's field work (2024)

Decision rule: if mean is 1-1.79= very low, 1.80-2.59 = low, 2.60-3.39=Moderate. 3.40-4.19= High, 4.20-5.0= very high

The overall mean score of 3.84 indicates that the level of quality service delivery in medical university libraries in Plateau and Nasarawa states is high. This suggests that the libraries are delivering quality services to their users. Under reliability, the respondents reported high levels of satisfaction with the speed of correcting wrongly posted users' information (mean = 4.06) and treating user's information needs promptly (mean = 4.04). Reliability (mean = 4.03): The respondents indicated that the library is reliable in delivering quality services. Empathy (mean =

3.86): The respondents indicated that the library has their customer's best interests at heart. Making extra efforts at meeting users' information needs via referral service (mean = 3.94) Having customer's best interests at heart (mean = 3.99). Tangibility (mean = 3.86): The respondents indicated that the library provides tangible items that meet their needs. Seating capacity of the library is befitting and appreciative to users (mean = 3.94) Up-to-date equipment/facilities for users (mean = 3.97). Responsiveness (mean = 3.74): The respondents indicated that the library staff is responsive to their needs. Librarians' priority to respond to users' queries (mean = 3.90). Library staff not being too busy to respond to users' requests (mean = 3.87). Convenient Environment (mean = 3.61): The respondents indicated that the library provides a convenient environment for their needs. Convenience to the library location (mean = 3.79) Convenience of the operation hours by librarians (mean = 3.60). The implication is that high level of quality service delivery in medical university libraries in Plateau and Nasarawa states, Nigeria, suggests that these libraries are meeting the needs of their users. The libraries' strengths in reliability, empathy, tangibility, responsiveness, and convenient environment indicate that they are providing quality services in these areas. Although the libraries are performing well, there is still room for improvement, particularly in areas where the mean scores are not at the highest level.

Research Question 2: What is the extent of user education to medical students influence quality service delivery in university libraries in Plateau and Nasarawa States?

Table: 2

Research question two. Extent of user education

User Education	Very High Extent (%)	High Extent (%)	Moderate Extent (%)	Low Extent (%)	VLL	Mean	SD
Library Tour (LT)						**403**	**.634**
Taking round to right sources for class assignment is to a	81(24.2)	203(60.6)	51(15.2)	--	---	4.09	.622
Library staff pointing out the location of materials is to a	76(22.7)	193(57.6)	66(19.7)	---	---	4.03	.651
Taking round to highlight appropriate research materials is to a	68(20.3)	198(59.1)	69(20.6)	----	----	4.00	.640
Taking round to show some basic research skill is to a	62(18.5)	206(61.5)	67(20)	-----	----	3.99	.621
Library Orientation (LO)						**4.01**	.638
Knowing the use of library through appropriate guidance is to	67(20)	209(62.4)	59(17.6)	-----	-----	4.02	.614
The instruction to the new users about the use of the library is to a	71(21.2)	197(58.8)	66(19.7)	1(.3)	-----	4.01	.650
Role of institution library to learning process is to a	73(21.8)	191(57)	70(20.9)	1(.3)	-----	4.00	.663
The awareness about different library resources is to a	64(19.1)	205(61.2)	66(19.7)	----	-----	3.99	.624
Virtual talk (VT)						**.00**	**,622**
Selecting the keyword option type search to generate report is to a	68(20.3)	202(60.3)	65(19.4)	---	----	4.01	.631
Using appropriate search term from between the keyword is to a	63(18.8)	211(63)	61(18.2)	----	----	4.01	.609

The teaching to enter the desire keywords within quotation marks is to a	62(18.5)	203(60.6)	70(20.9)	----	---	3.98	.628
Bibliography Instruction (BI)						**3.99**	**.633**
Description of materials is to	83(24.8)	182(54.3)	70(20.9)	--	--	4.04	.676
Searching materials in a particular subject area is to a	58(17.3)	208(62.1)	69(20.6)	---	---	3.97	.616
The description to physical organization of information is to a	55(16.4)	211(63)	69(20.6)	----	----	3.96	.608
Overall Mean						**4.01**	**.632**

Source: Researcher's field work (2024)

Decision rule: if mean is 1-1.79= very low, 1.80-2.59 = low, 2.60-3.39=Moderate. 3.40-4.19= High, 4.20-5.0= very high

The overall mean score of 4.01 indicates that the extent of user education in university libraries in Plateau and Nasarawa states, Nigeria is high. The extent of user education as regards to library tour is (mean = 4.03): The result revealed that the extent of library tour is high. Taking rounds to the right sources for class assignments (mean = 4.09). Library staff pointing out the location of materials (mean = 4.03). Library Orientation (mean = 4.01). The result showed that the extent of library orientation is high. Knowing the use of the library through appropriate guidance (mean = 4.02). Instruction to new users about the use of the library (mean = 4.01). Virtual Talk (mean = 4.00).The respondents indicated that the extent of virtual talk is high. Teaching to enter desired keywords within quotation marks (mean = 4.01). Selecting the keyword option type search to generate the report (mean = 4.01). Bibliography Instruction (mean = 3.99). The result revealed that the extent of bibliography instruction is high. Description of materials (mean = 4.04). Searching materials in a particular subject area (mean = 4.01).

Hypothesis 1: user education has no significant influence on quality service delivery in medical university libraries in Plateau and Nasarawa States, Nigeria.

Table: 3

Test of Hypothesis One: Influence of user education on quality service delivery.

Variables	***B***	***Std. Error***	***Beta (β)***	***T***	***Sig***	***Adj.R^2***	***F(df)***	***ANOVA Sig.***
(Constant)	36.760	3.148		11.676	.000	.323	40.918 (4, 330)	.000
Library Orientation	.854	.160	.271	5.334	.000			
Library Tour	.696	.181	.208	3.850	.000			
Bibliography Instruction	.599	.191	.156	3.136	.002			
Virtual Talk	.664	.195	.174	3.397	.001			

Dependent Variable: Quality Service Delivery

Source: Researcher's Field work, 2024

Table 4.3.4 presents the simple linear regression analysis results for testing Hypothesis One. The regression model revealed that user education significantly predicts quality service delivery among medical students ($Adj.R^2$= 0.323, $F(4, 330) = 40.92$, $p < 0.05$) The model indicated that 32.3%

(*Adj.*R^2= 0.323*)* of the variation in quality service delivery is explained by user education. The results further revealed that library orientation (β = 0.27, t(5.33)= 0.00. $p < 0.05$), library tour (β = 0.21, t (3.85)= 0.00, $p < 0.05$), bibliographic instruction (β = 0.16, t (3.14)= 0.00, $p <$ 0.05), and virtual talk (β = 0.17, t (3.40) = 0.00, $p <$ 0.05) significantly influenced quality service delivery in medical libraries. Thus, the null hypothesis (H_{01}: user education has no significant influence on quality service delivery) is rejected. The findings suggest that medical university libraries that enhance user education, such as library orientation, library tour, bibliographic instruction, and virtual talk, will significantly boost quality service delivery among their students. The implication of the result is that the study's results can be replicated and generalized to other medical university libraries in Nigeria, providing insights for improving user education and quality service delivery nationwide.

Hypothesis one examined the influence of user education on quality service delivery in medical university libraries in Plateau and Nasarawa states, Nigeria. The results showed that user education significantly influences quality service delivery in university libraries in Plateau and Nasarawa states, Nigeria. These findings are in agreement with Audu et al. (2021), who found that library orientation and bibliographic instruction significantly impact students' library patronage in universities in Benue State, Nigeria. Saturday et al. (2017) also reported that library training programs were successful in assisting users in identifying books, accessing information, and citing references. Oluyomi and Njoku (2016) found a significant relationship between user education and the use of the library, confirming that library environment and user education jointly contribute to library use. This supports the findings of Audu et al. (2021), which highlighted the significant perceived effect of library orientation and bibliographic instruction on students' library patronage. Ibrahim et al. (2020) agreed, reporting that most medical libraries in Pakistan use orientation, bibliographic instructions, and lectures as informal information literacy teaching methods. Ejiroghene et al. (2020) found that customer education approaches, including library orientation and guided tours, were effective in promoting library use among undergraduates in Warri, Nigeria. Abah et al. (2016) reported that students were provided with orientation and compulsory library courses, but time allocation and practicality were limitations. Maduako (2013) found that user education programs, including library orientation and bibliography instruction, enhanced library use despite challenges such as inadequate funding and staffing. Adeyemo (2018) concluded that user education positively influenced the utilization of library resources, supporting the current study's findings.

Overall, the results suggest that user education is a critical factor in quality service delivery in medical university libraries in Plateau and Nasarawa states, Nigeria. Implication of the study. The findings suggest that user education can lead to improved library services, including better utilization of library resources and increased students satisfaction. Libraries should invest in staff development to ensure that librarians are equipped to provide effective user education and support services. Overall, the study's findings emphasize the critical role of user education in quality service delivery in medical university libraries, highlighting the need for libraries to prioritize user education and invest in staff development, resource allocation, and assessment and evaluation

Conclusion and Recommendations

The study concluded that the key importance for improving quality service delivery to medical students. Medical university libraries must be encouraged to obtain accurate and timely services consequently, users' education was necessary knowledge that could assist library staff to

help medical students to carry out the required information in their studies in the university libraries. The recommended that libraries' management in Plateau and Nasarawa States should create room for improvement, particularly in staff responsiveness to users and convenient environment, to further enhance their quality services. The study also recommended that the management of university libraries in Plateau and Nasarawa States, Nigeria, should continue to create room for improvement in user education, particularly in areas such as bibliographic instruction, to enhance medical students' ability to locate resources in the university libraries. Library management should strategize on how librarians can effectively deliver user education to users in the library. The importance of placing high priority on bibliographic instruction and virtual talks for medical students cannot be overstated. Understanding the knowledge to be gained can have a significant and positive impact on users' studies

Reference

Adamu, R. (2017) Assessment of Library Service quality and user satisfaction among undergraduate students of Yusuf Maitama Sule University (YMSU) *Library Philosophy and Practice (e-journal). 16* *https://digitalcommons.unl.edu/libphilprac/1675*

Agoh A J &Omekwo C (2022) Library and Information services delivery and resources scholarly communication output in Agriculture research institutes in North Central Nigeria. International Journal of Library and information Science Studies 7(1)9-24

Ajayi S. A., Aboyade, M. A. & Madu, U. W. (2017) Redeeming the Nigerian economy from recession, librarian as rescue partners. *Library Philosophy and practice (e-journal)* Available at http:// digital commons uniedu/libphilprac/1594 Accessed

Bashorun, M.T.Aboderin O. A. & Lawal W. O. (2020) User education programmes as correlate in universities in Ogun State, Nigeria. *Journal of Library Service and Technology* 2 (1) 1-6 From online credence pressltd.com

Carvalho, M. M. & Domingueh, C. (2012) New challenges for the quality of librarian service delivery in Portugal available at https//wwwreserach gale.net/publication 243454257

Edeole, M. (2019) A pilot study on Awareness and use of library service among postgraduate students in Nigeria *Library Philosophy and Practice (e Journal)* https//digital commons and edu/librarypratice

Edidiong, A.A., Nse, E.A., Iniobong, M. & Eno, T. (2015). Accomplishing effective service delivery in academic libraries in Nigeria: The imperatives of IR, FOSS, Google, Wikipedia, Facebook, Twitter and Skype applications. Journal of Educational Research and Reviews, 3(1), 1-5.,

Ejiroghene, E. R. (2020) Influence of library environment and user education on undergraduate's use of library at college of education Warri, Nigeria *Library Philosoph y and Practice (e-journal). 4627. https://digitalcommons.unl.edu/libphilprac/4627*

Erkan, S. Alilagher G. & Utuk K. C. K. (2014) Service quality and customer satisfaction relationship a research erzurom

, Jones, E.T. (2005) The importance of communication quality in services. *https://diginote lib fsu edu. Object pdf view.*

Lujan S. & Armando L. (2017) The resources base view and the concept of emergence in value creation. Available in http://www redaly org/articub. oalld57184085002

Nagaraju, S (2009). "Library user Education Approach in Information age, with reference to Tess,Academic Libraries PEARL *3 (3) A Journal of Library and Information Science*

Muro, M., & Jeffrey, P. (2008). A critical review of the theory and application of social learning in participatory natural resource management processes. *Journal of environmental planning and management, 51(3), 325-344*

Obiora, K. U.,Joy I. I. & Ethel C. U. (2020) Undergraduate perception of library service quality and value in the 21st century in Southeast Nigeria. *Library Philosophy and practice e journal*. https"//digital commons Unl.edu/libphilpral/450/ori

Oyeyemi J. A. & Adayi, O. I. (2022) Influence of user education on the use of library resources in the Federal Polytechnic, Idah, Nigeria. (7) pp 16 *Journal of Applied Science and the Environment*

Parasuraman, A., Valarie, A. & Z. Leonard, B. (1984) A conceptual model of service quality and its implication for future research Seroquel. *Journal of Marketing* 19 41-50Available at https//www researchgate.net/publication/255983070)

Prabha, R.M., Perunjod, N & Soolakshna, B. (2010) Measuring service quality: perceptions of employees' *global journal of business research*.4 (1)

Razieh, T. N. & Mohammad, S. B. & Soolakshna, B. D. (2012) theory of developmental psychology, bandura is social learning theory and social cognitive learning *theory*.

Saunders, S. E. (2003) The effect of bibliographic instruction on the demand for reference services. Portal Libraries and the Academy, 3 (1), 35-39

Sharma, J. C. (2001) Total quality management in library and information services in Dawan S.M. (ed) Quest for quality Indian library Association, New Delhi 366-71

Young T.J. (2016) Questionnaire and survey. In 2hu Hua, Ed. research methods in intercultural communication. *A Practical Guide Oxford Wilej. 165-180*. From https//www research gate. net 'publication/316228107

SEARCH STRATEGIES FOR OPTIMIZING USE OF ONLINE DATABASE'S RESOURCES BY LIBRARY USERS OF AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA

Abba, Hamza PhD
Ahmadu Bello University, Zaria

Huzaifa Abubakar Dansabo
Department of Information Technology, Central Bank of Nigeria

Sa'adatu Ummi Yusuf (CLN)
Department of Library Services, Supreme Court of Nigeria, Federal Capital Territory, Abuja

Abstract

This study investigated Search Strategies for Optimizing Use of Online Database's Resources by Library Users of Ahmadu Bello University, Zaria, Nigeria. The objectives were; to identify the search strategies used by Postgraduate Students to retrieve Information resources on online databases and to find out the most consulted Information Resources on the online databases. Quantitative research methodology and survey research design were used for the study. The population of the study comprised postgraduate students of two selected faculties of Ahmadu Bello University Zaria which are Faculty of Education and Social Science, the Postgraduate students in the faculties were two thousand six hundred and seventy (2,670). The sample size of the study is 134 which is 5% of 2670. Questionnaire was used as the instrument for data collection. The data collected was analyzed and interpreted using frequency tables and simple percentage. The findings revealed significant variations in search strategy adoption, with Boolean operators being the most frequently used technique (44.9%) and proximity search (10.2%) as underutilized. Regarding information resource preferences, journal articles achieved universal utilization (100.0%), followed by books (96.9%) and theses and dissertations (94.9%), while specialized resources like memoranda with (4.1%) received minimal attention. The study concluded that postgraduate students in the selected faculties mostly utilize Boolean operators for retrieving online information resources on databases. The study recommends implementing comprehensive information literacy training programs focusing on advanced search techniques and developing strategic initiatives to promote awareness of underutilized information resources. .

Keywords: Ahmadu Bello University, Information Resource, Online Databases, Search Strategies, Postgraduate Students, Use, Zaria

Introduction

The digital revolution has fundamentally transformed how online information is accessed, evaluated, and utilized in higher education institutions worldwide. Online databases have emerged as critical repositories of scholarly information, providing postgraduate students with unprecedented access to peer-reviewed journals, conference proceedings, dissertations, and other academic resources essential for advanced research (Kumar & Singh, 2019). The proliferation of these digital resources has necessitated the development of sophisticated search strategies and

information literacy skills among graduate students to effectively navigate the complex landscape of academic information retrieval.

At Ahmadu Bello University (ABU), one of Nigeria's premier institutions of higher learning, the integration of online databases into the academic research process has become increasingly important for postgraduate education. The university's commitment to research excellence and knowledge creation requires that its postgraduate students possess advanced information retrieval skills and demonstrate proficiency in utilizing various online databases (Okello-Obura & Magara, 2018). However, the effectiveness of these digital resources depends largely on students' ability to employ appropriate search strategies and their preferences for specific types of information resources available through these platforms.

The concept of search strategies encompasses the systematic approaches, techniques, and methodologies that users employ to locate relevant information within digital databases. These strategies include the use of Boolean operators, controlled vocabulary, truncation techniques, field-specific searches, and advanced filtering options (Asemi, 2021). The sophistication of search strategies directly correlates with the quality and relevance of retrieved information, making it a critical determinant of research success in postgraduate studies. Furthermore, understanding students' information resource preferences provides insights into their research habits, disciplinary requirements, and the perceived value of different types of scholarly materials. The Nigerian higher education context presents unique challenges and opportunities for digital information access. While the country has made significant strides in expanding internet connectivity and digital infrastructure, issues such as bandwidth limitations, power supply inconsistencies, and varying levels of digital literacy among students continue to influence how online databases are utilized (Adebayo et al., 2020). Additionally, the cultural and linguistic diversity of Nigerian students, combined with different educational backgrounds and research traditions, creates a complex environment for information-seeking behavior that requires careful investigation.

This study is justified by the need to understand and optimize the utilization of online databases in Nigerian higher education, particularly at ABU, where postgraduate programs span diverse disciplines with varying information needs. The findings will contribute to the development of targeted information literacy programs, inform database subscription decisions, and enhance the overall research capacity of postgraduate students. Moreover, the study addresses the gap in empirical research on information-seeking behavior among postgraduate students in sub-Saharan Africa, providing valuable insights that can inform policy and practice in similar institutional contexts.

Statement of the Problem

In an ideal academic environment, postgraduate students should possess advanced information literacy skills that enable them to efficiently navigate online databases, employ sophisticated search strategies, and critically evaluate information resources to support their research endeavors. However, preliminary observations and anecdotal evidences from other researchers suggest that many postgraduate students at Ahmadu Bello University may not be optimally utilizing the online databases available to them. There appears to be a significant gap between the sophisticated search capabilities offered by modern database platforms and the actual

search strategies employed by students, with many relying on basic keyword searches without fully exploiting advanced search features such as Boolean operators, controlled vocabulary, citation searching, and database-specific tools that could significantly enhance their information retrieval effectiveness.

The consequences of not addressing this research gap are multifaceted and potentially detrimental to the quality of postgraduate education and research at ABU. Students who lack effective search strategies may experience decreased research efficiency, spending excessive time on information retrieval while potentially missing relevant high-quality sources, which can lead to research projects based on incomplete or sub-optimal literature foundations, ultimately affecting the quality of dissertations, theses, and academic publications. This knowledge gap also limits the institution's ability to advocate for appropriate digital infrastructure investments and to develop targeted interventions that could enhance student research capabilities and overall academic success.

Objectives of the Study

The objectives of the study are to:

1. To identify the search strategies used by Postgraduate Students to retrieve Information resources on online databases
2. To find out the most consulted Information Resources on the online databases.

Literature Review

The literature on search strategies employed by postgraduate students reveals a complex landscape of information-seeking behaviors that vary significantly across disciplines, technological proficiency levels, and institutional contexts. Research by Chen and Brown (2020) demonstrated that postgraduate students typically employ a combination of basic and advanced search strategies, with the choice of strategy often influenced by factors such as time constraints, familiarity with database interfaces, and the perceived complexity of their research questions. Their study found that while students are generally aware of advanced search features, many default to simple keyword searches due to convenience and habit, suggesting a gap between knowledge and application in search strategy implementation.

The cognitive aspects of search strategy selection have been extensively studied by Kumar et al. (2019), who identified several key factors that influence how postgraduate students approach information retrieval tasks. Their research revealed that students often begin with broad, exploratory searches before narrowing their focus through iterative refinement processes. This finding aligns with the information-seeking models proposed by Ellis (1989) and later refined by Ellis et al. (1993), which describe information behavior as a series of interconnected activities including starting, chaining, browsing, differentiating, monitoring, and extracting. The study also highlighted the importance of domain expertise in determining search strategy effectiveness, with students in their advanced stages of study demonstrating more sophisticated search behaviors compared to those in their early postgraduate years. Database-specific search strategies have been the focus of numerous studies, with researchers examining how the unique features and interfaces of different databases influence user behavior. Martinez and Garcia (2018) conducted a comprehensive analysis of search patterns across multiple academic databases, finding that

students often struggle to transfer search skills from one database to another due to interface differences and varying search syntax requirements. Their research emphasized the importance of database-specific training and the need for more standardized search interfaces across platforms. Additionally, they found that students frequently underutilize advanced features such as controlled vocabulary browsing, citation searching, and related article suggestions, which could significantly enhance their information retrieval effectiveness.

The role of Boolean logic and advanced search operators in postgraduate student research has been examined by several researchers, with mixed findings regarding student proficiency and utilization. Johnson and Williams (2021) found that while most postgraduate students have been exposed to Boolean operators during their undergraduate studies, many lack confidence in applying these techniques effectively in complex research scenarios. Their study revealed that students often experience frustration when Boolean searches return unexpected results, leading them to abandon these techniques in favor of natural language searching. This finding is particularly significant given that many academic databases are optimized for Boolean searching and may not provide optimal results for natural language queries. The impact of disciplinary differences on search strategy preferences has been well-documented in the literature, with studies consistently showing that students in different fields employ distinct approaches to information retrieval. Thompson et al. (2020) conducted a multi-disciplinary study comparing search behaviors across science, technology, engineering, mathematics (STEM), social sciences, and humanities fields. Their findings revealed that STEM students tend to prefer highly specific, technical searches using controlled vocabulary and field-specific databases, while humanities students often employ broader, more exploratory search strategies that emphasize contextual and interdisciplinary connections. Social science students demonstrated hybrid approaches, combining elements of both STEM and humanities search strategies depending on the nature of their research questions.

The landscape of information resources available through online databases has expanded dramatically in recent decades, encompassing traditional scholarly journals, conference proceedings, dissertations, books, reports, and multimedia content. Research by Adams and Clark (2019) examined the utilization patterns of different resource types among postgraduate students, finding that peer-reviewed journal articles remain the most heavily consulted resource type across all disciplines. Their study revealed that 78% of postgraduate students' database usage time was devoted to accessing journal articles, with the remaining 22% distributed among other resource types including conference papers (8%), dissertations (6%), books (4%), and reports (4%). This preference for journal articles was attributed to their perceived reliability, currency, and relevance to advanced research topics.

The temporal aspects of information resource preferences have been investigated by Roberts and Lee (2020), who found that postgraduate students demonstrate distinct patterns in their consultation of resources published in different time periods. Their longitudinal study revealed that students typically begin their research by consulting the most recent publications in their field, gradually expanding their search to include older materials as they develop a deeper understanding of their research domain. The study also found significant disciplinary differences in temporal preferences, with STEM students showing a strong preference for recent publications (within the last 5 years), while humanities students were more likely to consult older materials that

provide historical context and theoretical foundations. The influence of resource accessibility and availability on consultation patterns has been extensively studied, with researchers examining how factors such as open access availability, institutional subscriptions, and technical barriers affect student information behavior. Peterson and Kumar (2021) conducted a comprehensive analysis of resource utilization patterns, finding that accessibility significantly influences consultation frequency regardless of resource quality or relevance. Their study revealed that students are more likely to cite and utilize resources that are freely available or easily accessible through their institutional subscriptions, even when higher-quality resources exist behind paywalls or in less accessible formats. This finding has important implications for collection development and resource licensing decisions in academic libraries.

The quality and authority of information resources have been identified as key factors influencing postgraduate student preferences, though research suggests that students' ability to evaluate these characteristics varies significantly. Davis and Martinez (2018) examined how postgraduate students assess the credibility and reliability of different information resources, finding that students rely heavily on proxy indicators such as publisher reputation, author affiliation, and citation counts rather than conducting comprehensive quality assessments. Their study revealed that students often assume that resources available through academic databases are inherently credible, potentially leading to insufficient critical evaluation of information sources. This finding highlights the importance of information literacy education that emphasizes critical thinking skills alongside technical search competencies. The emergence of interdisciplinary research has significantly influenced information resource preferences among postgraduate students, with many students requiring access to materials from multiple fields and databases. Wilson et al. (2019) investigated the information-seeking behavior of interdisciplinary researchers, finding that these students face unique challenges in identifying and accessing relevant resources across different disciplinary boundaries. The study revealed that interdisciplinary students often rely on broader, multidisciplinary databases rather than field-specific resources, and they frequently struggle to develop comprehensive search strategies that adequately cover all relevant domains. The research also found that interdisciplinary students place greater emphasis on recent review articles and meta-analyses that synthesize knowledge across multiple fields, viewing these resources as efficient ways to gain broad understanding of complex topics.

Methodology

Quantitative research methodology was adopted and survey research design was used for the study. The population of this study comprised of two (2) faculties of Ahmadu Bello University Zaria which include Faculty of Education and Social Science, and the PG students in the faculties were two thousand six hundred and seventy (2,670). These two faculties were selected because of the large population of the university as a whole and time will not permit expanding the research to cover other faculties. The total sample size for the two faculties is 134 which 5% of 2670 as opined by Yount (2006). Questionnaire was used as the instrument for data collection. The data collected was analyzed and interpreted using frequency tables and simple percentage.

Results and Discussion

The analysis was done base on the response rate, where 134 copies of questionnaire were distributed and 98 representing 73% were returned and used for the analysis.

Table 1: Search Strategies used by Postgraduate Students to retrieve Information resources on online databases

S/N	Search Strategies	Frequency	Percentage (%)
1.	Boolean Operators	44	44.9
2.	Using Parenthesis	25	25.5
3.	Phrase Searching	29	29.6
4.	Fuzzy Search	11	11.2
5.	Truncation searches	15	15.3
6.	Proximity search	10	10.2
7.	Stemming	7	7.1
8.	Wildcard searches	18	18.4

Source: *Field Survey (2025)*

Table 1 presented the analysis of search strategies employed by postgraduate students at Ahmadu Bello University reveals significant variations in the adoption of different search techniques. Boolean operators emerged as the most frequently used search strategy with 44 students (44.9%) utilizing this technique, followed by phrase searching employed by 29 students (29.6%). Using parenthesis was adopted by 25 students (25.5%), while wildcard searches were used by 18 students (18.4%). Truncation searches were employed by 15 students (15.3%), fuzzy search by 11 students (11.2%), proximity search by 10 students (10.2%), and stemming was the least utilized strategy with only 7 students (7.1%) employing this technique. The findings indicate that Boolean operators and phrase searching represent the most preferred search strategies, while advanced techniques like stemming and proximity search are least utilized. This pattern suggests that postgraduate students tend to rely on basic to intermediate search strategies rather than advanced techniques that could potentially enhance their search precision and recall. The preference for Boolean operators reflects students' familiarity with basic logical connectors (AND, OR, NOT), while the low utilization of advanced techniques like stemming and proximity search may indicate insufficient training in sophisticated database search methodologies. Johnson and Williams (2021) findings stressed that Boolean operators significantly enhanced databases optimization when searching searching information resources and may provide optimal results for queries. This finding has significant implications for information literacy instruction, suggesting the need for enhanced training programs that emphasize advanced search techniques to improve research efficiency and effectiveness among postgraduate students.

Table 2: Most consulted Information Resources on the online databases

S/N	Information Resources	Frequency	Percentage (%)
1.	Books	95	96.9
2.	Journal Articles	98	100.0
3.	Conferences Paper	60	61.2
4.	Periodicals	15	15.3
5.	Research Monographs	11	11.2
6.	Research Reports	64	65.3
7.	Memoranda	4	4.1
8.	Websites	49	50.0
9.	Works of Arts, Architecture	14	14.3
10.	Index	18	18.4
11.	Indexing periodicals	22	22.4
12.	Monographs	12	12.2
13.	Dictionary	85	86.7
14.	Thesis and Dissertation	93	94.9
15.	Manuscripts	24	24.5
16.	Speeches	20	20.4
17.	Literature and Music	39	39.8
18.	Bibliographies	87	88.8
19.	Abstracting periodicals	15	15.3
20.	Encyclopedia	64	65.3
21.	Handbook, Manual	16	16.3
22.	Bibliography of Bibliographies	34	34.7
23.	Guide to Literature	11	11.2
24.	Television	98	100.0
25.	Audio	9	9.2
26.	Videos	88	89.8
27.	Lecture note	95	96.9
28.	Directories and year books	11	11.2

Source: *Field Survey (2025)*

Table 2 presented the information resources consulted by postgraduate students reveals distinct preferences and utilization patterns across various resource types. Journal articles and television both achieved universal utilization with 98 students (100.0%) consulting these resources, followed closely by lecture notes and books, each accessed by 95 students (96.9%). Theses and dissertations were consulted by 93 students (94.9%), while bibliographies were accessed by 87 students (88.8%). Videos were utilized by 88 students (89.8%), dictionaries by 85 students (86.7%), and research reports and encyclopedias were each consulted by 64 students (65.3%). Conference papers were accessed by 60 students (61.2%), websites by 49 students (50.0%), and literature and music resources by 39 students (39.8%). Bibliography of bibliographies was consulted by 34 students (34.7%), manuscripts by 24 students (24.5%), indexing periodicals by 22 students

(22.4%), and speeches by 20 students (20.4%). Index resources were accessed by 18 students (18.4%), handbooks and manuals by 16 students (16.3%), while periodicals and abstracting periodicals were each consulted by 15 students (15.3%). Works of arts and architecture were accessed by 14 students (14.3%), monographs by 12 students (12.2%), and research monographs, guide to literature, and directories and yearbooks were each consulted by 11 students (11.2%). Audio resources were the least consulted with only 9 students (9.2%), followed by memoranda accessed by 4 students (4.1%). The findings reveal that journal articles, television, lecture notes, books, and theses represent the most heavily consulted resources, while audio materials and memoranda are least utilized. This pattern reflects the academic nature of postgraduate research, where peer-reviewed journal articles and formal academic publications are prioritized for their credibility and relevance. The high utilization of multimedia resources like television and videos indicates students' preference for diverse information formats that enhance understanding and engagement. The findings was supported by that of Roberts and Lee (2020), who found that postgraduate students demonstrate distinct patterns in their consultation of resources published in different time periods.The implications suggest that academic libraries should prioritize subscriptions to comprehensive journal databases and multimedia collections while providing training on effectively utilizing less popular but potentially valuable resources like audio materials and specialized indexes.

Conclusion and Recommendations

This study provides valuable insights into the search strategies and information resource preferences of postgraduate students at Ahmadu Bello University. The research reveals a concerning gap between the sophisticated search capabilities available in modern online databases and the actual search techniques employed by students. While students demonstrate competency in basic search strategies, the underutilization of advanced search techniques suggests missed opportunities for enhanced research efficiency and comprehensiveness. The strong preference for traditional academic resources, particularly journal articles and books, reflects appropriate scholarly behavior but also indicates potential under exploration of diverse information formats that could enrich research perspectives. The study contributes to understanding information behavior in the Nigerian higher education context and provides empirical evidence for developing targeted interventions to enhance postgraduate research capabilities. The implications extend beyond individual student success to institutional resource allocation, library service development, and the overall quality of postgraduate education at ABU.

The following recommendations were made: The library and information services department at Ahmadu Bello University should develop and implement a comprehensive information literacy training program specifically designed for postgraduate students which should focus on advanced search strategies including stemming, proximity search, and fuzzy search techniques, the training should be delivered through a combination of face-to-face workshops, online tutorials, and embedded instruction within specific academic programs. Additionally, the program should be integrated into the postgraduate curriculum as a mandatory component, ensuring all students receive adequate preparation for effective database utilization throughout their academic journey. The university library should also undertake a strategic initiative to

promote awareness and utilization of underutilized information resources, particularly audio materials, specialized indexes, and multimedia collections which should involve creating resource guides that highlight the value and appropriate use cases for different resource types, developing discipline-specific tutorials that demonstrate how various resources can enhance research quality, and establishing partnerships with academic departments to integrate diverse resource utilization into coursework and research methodology training.

References

Adams, S., & Clark, M. (2019). Information resource utilization patterns among postgraduate students: A multi-institutional study. *Journal of Academic Librarianship*, 45(3), 234-247. https://doi.org/10.1016/j.acalib.2019.03.012

Adebayo, O., Ogunniyi, S., & Adeyemi, T. (2020). Digital infrastructure and information access in Nigerian universities: Challenges and opportunities. *African Journal of Library, Archives and Information Science*, 30(2), 89-104.

Asemi, A. (2021). Advanced search strategies in academic databases: A systematic review. *Information Processing & Management*, 58(4), 102-118. https://doi.org/10.1016/j.ipm.2021.02.089

Chen, L., & Brown, R. (2020). Postgraduate student search behavior in academic databases: A mixed-methods approach. *Journal of Information Science*, 46(2), 178-194. https://doi.org/10.1177/0165551519845852

Davis, P., & Martinez, C. (2018). Information quality assessment among graduate students: Practices and challenges. *College & Research Libraries*, 79(4), 512-529. https://doi.org/10.5860/crl.79.4.512

Ellis, D. (1989). A behavioural approach to information retrieval system design. *Journal of Documentation*, 45(3), 171-212. https://doi.org/10.1108/eb026843

Ellis, D., Cox, D., & Hall, K. (1993). A comparison of the information seeking patterns of researchers in the physical and social sciences. *Journal of Documentation*, 49(4), 356-369. https://doi.org/10.1108/eb026919

Johnson, K., & Williams, T. (2021). Boolean logic proficiency among postgraduate students: A comparative study. *Information Research*, 26(1), 1-18. http://informationr.net/ir/26-1/paper892.html

Kumar, R., & Singh, P. (2019). Digital transformation in academic libraries: Impact on postgraduate research. *International Journal of Information Management*, 48, 234-245. https://doi.org/10.1016/j.ijinfomgt.2019.02.008

Kumar, S., Patel, N., & Sharma, A. (2019). Cognitive factors in information retrieval: A study of postgraduate student behavior. *Journal of Information Science Theory and Practice*, 7(3), 45-62. https://doi.org/10.1633/JISTaP.2019.7.3.4

Martinez, F., & Garcia, J. (2018). Database interface design and user search behavior: A usability study. *Information Technology and Libraries*, 37(2), 78-95. https://doi.org/10.6017/ital.v37i2.10165

Okello-Obura, C., & Magara, E. (2018). Information seeking behavior of postgraduate students in developing countries: A case study approach. *Library Philosophy and Practice*, 1-22.

Peterson, A., & Kumar, V. (2021). Accessibility and information resource utilization in academic settings. *Academic Libraries Review*, 28(3), 156-173.

Roberts, J., & Lee, S. (2020). Temporal patterns in academic information seeking: A longitudinal study. *Information Processing & Management*, 57(2), 289-305. https://doi.org/10.1016/j.ipm.2019.12.004

Thanuskodi, S. (2019). Information seeking behavior of postgraduate students: A comparative study. *Library Progress International*, 39(2), 201-215.

Thompson, D., Anderson, M., & White, L. (2020). Disciplinary differences in database search strategies: A multi-field analysis. *Journal of Academic Librarianship*, 46(5), 102-119. https://doi.org/10.1016/j.acalib.2020.102119

Wilson, R., Smith, K., & Jones, P. (2019). Interdisciplinary information seeking: Challenges and strategies for postgraduate researchers. *Research Libraries Review*, 31(4), 445-462.

IMPACT OF DONATED MATERIALS ON ACADEMIC LIBRARY SERVICES: INSIGHTS FROM SELECTED UNIVERSITY LIBRARIES IN GHANA

Frank Boateng Afoakwa
Presbyterian University, Ghana

Samuel Ameyaw
Valley View University, Ghana

Abstract

This research assessed the impact of donated materials on academic library services using data from selected university libraries in Ghana. The objectives were to find out the types of donations received by academic libraries, assess the impact of donations on academic library service and to ascertain the challenges posed by donated materials to academic libraries. The study adopted a qualitative research design, using an interview guide to collect qualitative data. The results showed that donations contribute to the growth of library collections. However, they also pose challenges, such as not aligning with the academic curriculum, having low-quality materials, being in poor condition, and occupying storage facilities in the library. Several respondents expressed that donated material adds extra work for library staff due to processing and cataloguing. The absence of written policies on donation would aggravate these challenges, complicating the effective management of donations. The study recommended a strategic framework, including the formulation of donation policies. Libraries must ensure that donated materials meet the academic objectives of the institutions. The researchers made recommendations for academic libraries in Ghana to maximise the benefits of donated materials while addressing the challenges associated with them.

Keywords: Academic Library, Donated materials, Ghana, Impact, Library Services, University Libraries

Introduction

An academic library serves the educational and research needs of students, faculty, and staff in the university environment. The coverage or scope of their materials is very comprehensive because of the nature of their clientele. An academic library supports individual growth in wisdom within the academic community. The primary focus is to promote research and knowledge development across various fields of study (Alam, 2022). The absence of a robust, well-funded library would impede the university's ability to fulfil its missions and objectives. Ajibola and Kolawole (2021) indicate that the academic library is the pivotal centre of the institution.

These libraries operate as a pool of knowledge for students and faculty. The library ensures that the environment is conducive for research and learning. Despite these services, academic libraries face challenges related to the influx of donated materials. Libraries often receive donations that are irrelevant to some disciplines, including old editions of textbooks. The physical condition of many donated materials can also be problematic. For instance, some donated materials come along with foreign language used in writing, as well as books with torn or missing pages. It is crucial to evaluate library collections to confirm their alignment with the information needs of

academic institutions (Arshad et al., 2021; Jan & Ganiae, 2019). This evaluation should include a review of the collection's content, its frequency of use, and the effects of ongoing trends or global changes. Evaluating the repercussions of donated materials on academic library services involves a detailed investigation into how these resources shape the library's operations, resource availability, and overall user service. The study aims to evaluate the impact of donated resources on academic library services. The study will also make recommendations to library management on how to handle gifts and donated materials.

Objective of the study; the objectives of the study were;

1. To find out the types of donations received by academic libraries
2. To assess the impact of donations on academic library service
3. To ascertain the challenges posed by donated materials to academic libraries

Literature Review

Libraries can obtain materials through various means, such as donations (gifts-in-kind), interlibrary loans, exchanges, cooperative acquisitions, and direct purchases. Each of these methods is essential for collection building. Akussah et al. (2025) noted that academic libraries commonly receive books as donations but also accept digital resources, equipment, journals, and materials in local languages, provided they meet academic and relevant standards.

Most libraries in Africa have relied heavily on grants and donations, which led to challenges in acquiring informational resources when such funding is unavailable (Walters, 2013). The swift expansion and increase in the number of universities, coupled with inadequate funding for university libraries, have led to the acceptance of a mix of valuable and less desirable materials donated to academic libraries. This phenomenon frequently occurs as libraries strive to meet users' needs and improve their collections. Sisimwo et al. (2016) indicated six approaches to obtaining materials for the library. They include purchasing, trading, receiving, donating, bequeathing, and legally depositing. Donations or gifts often provide resources that would otherwise be inaccessible due to budgetary constraints. However, these contributions may also create obstacles in preserving the quality of library services. They often come with specific conditions or restrictions that do not align with the library's policy. Factors such as inadequate storage capacity, high processing costs, and the obligation to manage outdated or irrelevant materials can complicate the benefits of donations. Patricia (2009) asserted that numerous African libraries rely significantly on book donations and financial support from individuals and organisations to sustain their operations. According to Johnson (2009), books and other materials donated as gifts constitute the majority of academic library collections in the United States. Frempong-Kore (2020) asserted that academic libraries frequently obtain donations that are either obsolete, misaligned with curricular requirements, or composed in languages that are difficult to understand. The implication is that in the absence of well-defined donation policies and assessment procedures, libraries may inadvertently clutter their collections with materials that lack relevance, potentially compromising the quality of the collection and diminishing user satisfaction. The practice of gifting and donating is not detrimental to libraries, but the quality and appropriateness of the materials are crucial.
In today's digital context, libraries must prioritise donations that enhance their identities as modern information institutions rather than reverting to antiquated approaches.

Donations have long been valuable resources for academic libraries. Donations help libraries to support research, teaching, and learning. Materials sometimes donated to libraries include books, journals, multimedia resources, and other items. These materials provide considerable benefits to libraries. They also enhance collections and increase stock in a particular library. However, some materials donated to libraries become obsolete, redundant, or unrelated to the subject focus. Although private universities do not qualify for grant funding, they reap the benefits of book donations Onyeike and Eseyin, (2014) in Shehu et al. (2023). Thomas and Shouse (2014) declared, "We should not be 'dumpsites for people's used books," and lamented the lack of relevant materials on offer (p. 63). It will cause harm to library patrons if anything is accepted. As the knowledge hub of the university, the library should centre on knowledge development, especially in this era of knowledge abundance. The absence of rich collections and organised frameworks would profoundly defeat the purpose. Shehu et al. (2022) asserted that the primary responsibility of an academic library regarding its selection and collection of books is to ensure that the materials are available to support teaching, learning, and research, including the present and the future. Donated materials must enhance the development of critical thinking and research competencies. Donations or gifts significantly address resource deficiencies in subject areas in the collections. It is better to have empty shelves in the library than to have irrelevant materials occupying all the shelves. Sturges and Gastinger (2014) wrote that "refusal is often good librarianship", yet they stressed the need for tact when doing so (p. 38).

Edem (2010) conducted an extensive multi-year analysis of 2,462 donated volumes at the University of Calabar Library. Academic libraries must carefully consider donations, as they can either benefit or hinder their operations (Emanuel, 2014; Gregory, 2011). Librarians must apply their professional skills to evaluate the value of donated materials. The assessment must include the cost of processing before accepting donations. Donations provide valuable information resources for libraries, but their acceptance should be motivated by a clear policy to ensure relevance and suitability for the collection. It is crucial to underscore that providing books and other resources to libraries in developing countries reveals a paradox where a seemingly benevolent gift may inadvertently create more challenges than it resolves (Sturges, 2014). Many of these donated materials are often unsuitable for use due to factors such as irrelevant content, outdated information, or being written in foreign languages (Frempong-Kore, 2020).

O'Hare and Smith (2011) suggested that some donations could help mitigate the decline in library collection. However, specific categories of gifts may be more troublesome than beneficial. Unwanted materials can incur additional expenses, particularly when the evaluation of a prospective donation reveals that its contents are not as relevant as anticipated (Arthur, 2009). A key concern regarding donations and gifts is the risk of introducing harmful agents, such as insects, rodents, and moulds. These agents often enter the library through donated materials that grow rapidly and threaten the entire collection. One of the main challenges libraries face with donations or gifted materials is insect infestation and mould, which can potentially spread to other parts of the collection and cause damage to materials (Arthur, 2009). O'Hare and Smith (2011) suggest that libraries should be allowed to accept donations, provided they retain the right to discard materials deemed duplicates or relevant. The authors highlighted that rejecting donations may negatively hinder library services. Lietaer (2008) found that many donors often expect their books to be kept and displayed in unison, which can be challenging for most libraries due to various constraints.

Johnson (2004) suggests that libraries should decline donations with conditions, particularly when donors impose restrictions on the libraries to process their donated materials. Frempong-Kore (2020) asserted that donations made to academic libraries typically come with various restrictions or conditions, and it is essential that these stipulations are communicated clearly from the very beginning. These restrictions may involve the ways in which the donated items are utilised, catalogued, or displayed, potentially resulting in operational challenges for librarians. Most materials were written in languages other than English, making them less accessible to some users. Additionally, donation patterns were inconsistent, and interest in electronic resource delivery was despite the continued availability of manual materials, Edem (2010).

Methodology

The study adopted a qualitative approach in selected libraries to examine the impact of donated materials on academic library services. The design was chosen because it allows for an in-depth understanding of participants' perspective, and interpretations within their real-life contexts. The researchers selected the Daniel Kwame Bediako Library in Kumasi and the Presbyterian University Library in Ghana. The justification for their selection was motivated by their accessibility to the researchers. The preliminary investigations revealed a scarcity of literature addressing the impact of donations on academic library services.

The study involved two representatives from each university library. They included the head librarians and acquisition librarians or assistants. The researchers selected these participants based on their direct involvement in material acquisition, selection, donation, and the overall administration of library services and collections. The research employed a semi-structured interview guide as a data collection instrument to gain an in-depth understanding of the specific context of the donations. This method also allowed participants to share their views on donations. The researchers conducted face-to-face interviews with the participants in their respective offices. The gathered data were analysed using thematic analysis, following established procedures to ensure validity and rigour. This analysis aimed to identify prominent patterns and themes associated with materials donated to academic libraries.

Participants were assigned code names throughout the analysis process to maintain confidentiality. The data underwent coding, which enabled the organising of insights into meaningful categories. The themes were subsequently refined by categorising the codes into more expansive groups that align with the research objectives, thus illuminating the concerns surrounding donated materials. The alphanumeric codes were applied to represent each university and to ensure confidentiality. For instance, The researchers used "Univ A R1, Univ A R2" and "Univ B R1, Univ B R2" to represent Universities A and B. All information by the participants was handled with the highest level of confidentiality and used solely for this research study.

The researchers obtained informed consent from the participants before their involvement in the study. They provided comprehensive information regarding the study's objectives and ensured that all participants understood this information before the commencement of the study. Furthermore, the researchers emphasised the confidentiality of the participants' identities and made it explicitly clear that individuals had the right to withdraw from the study at any point without repercussions.

Result and Discussion

Demographic information of the respondent

The data presented comprises the age distribution, gender, rank, and professional experience of four participants. Below is a detailed analysis and interpretation of the results.

Table 1: Demographic information of the respondent

Source; Field data, 2025

Age	**Frequency**	**Percentage**
35-40	-	
41-45	1	25
46-50	1	25
51-55	1	25
56-60	1	25
Total	**4**	**100**

Gender	**Frequency**	**Percentage**
Female	1	25
Male	3	75
Total	**4**	**100**

Rank	**Frequency**		**Percentage**
	Univ.A	**Univ.B**	
Senior Assist Librarian	-	1	25
Deputy Librarian	1	-	25
University Librarian	1	1	50
Total	**2**	**2**	**100**
Grand Total		**4**	

	Working Experience (Years)			**Working Experience (Years)**
Univ. A	University Librarian	18	Deputy Librarian	6
Univ. B	University Librarian	8	Senior Assist Librarian	5
Total		26		11
Grand Total			**37**	

The age distribution was across four distinct age categories (41-60 years). There were no respondents between the 35-to-40 age ranges. Each of the four participants constitutes 25% of the total sample size. The findings implied that all the participants were experienced and mature. Male participants represented 75%, while the female participants represented 25%. Additionally, one senior assistant librarian and one deputy librarian each represented 25%. Furthermore, the distribution of respondents is evenly divided between University A and University B, providing a balanced representation of the institutions. Respondents have a cumulative total of 37 years of

work experience. University A contributes 24 years to this total, whereas University B accounts for 13 years. The librarian at University A has the highest working experience, 18 years, while the senior assistant librarian at University B has the least, with 5 years of experience. This result indicates that the respondents are seasoned professionals, thereby enhancing the credibility of the study's findings.

University A

Objective 1: Types of donations received by academic libraries.

The following were the responses elicited from the respondents regarding types of donations received by academic libraries:

R1 from University A respondent that:

"We receive a wide array of donations in the library. These include books, digital resources and technological equipment. Each donation contributes to teaching, learning, and research activities."

The researchers asked about the importance of donated materials to the library. These were the sentiments voiced by the respondents:

"The influx of donated materials enables academic libraries to remain pertinent and adaptable to the changing demands of the university community. I will say yes, donations help the successful operation of libraries."

The R2 from University A was the view that:

"*Our library generally benefits from donations despite their infrequent nature; occasionally, we receive tangible items. We don't receive only books; we sometimes receive electronic materials and digital resources in soft and hard formats. Each gift and donation is essential for strengthening the collections."*

The interviewers inquired about the process of accepting donated materials. The respondent expressed the following views:

" We get input from faculty and students before accepting certain donations. The evaluation process is thorough, drawing on multiple views to guarantee that the donations are relevant."

The respondent added.

University B

The interviewee from University B (R1) opined that:

"*The role of donations in the academic library collections is undeniable. Our library relies on the generosity of individuals, groups, and organisations to expand its collections. Our services in the university community are improving through donations."*

The respondent emphasised that:

"We receive books and journals (e.g. print and digital formats), laptops, mini PCs or thin clients, and printers. These donations and gifts often originate from individuals, philanthropic entities, and alumni."

R2 from University B contributed the following:

"*Hmmm!* Books *stand out as one of the most significant and frequently received categories in terms of donations. The donated materials include textbooks, scholarly texts, and reference books."*

Furthermore, the respondent explained:

"These materials also include fiction and non-fiction works that support various academic fields.
"Frequently, these donations address gaps in specific subject areas or augment the collections.

Additionally, such donations can significantly enhance the collections by providing access to rare or out-of-print titles that are not easily obtainable through traditional channels."

University A

Objective 2: Assessment of the impact of donations on academic library services.

The researchers find out how librarians assess the impact of donated materials in their libraries. The R 1 from University A (R1) highlighted that:

"Yes, donation improves resource accessibility for students and faculty, especially those facing financial and resource challenges". Evaluations involve content alignment, physical condition, and collection needs. Donated journals and periodicals provide current research resources, enhancing academic advancement and scholarly pursuits."

In response to the same question, R2 from University A shared the following:

"The respondent remarked that; "… *sure, donations in a university library enhance teaching and learning. They also expand library collections and preserve essential materials for academic curricula."*

The respondent added that:

"Donated materials undergo a comprehensive evaluation process. They include content alignment, physical condition assessment, and analysis to enhance resources."

R2 explained that… *"donated journals and periodicals serve as valuable research materials. They reduce economic challenges caused by expensive subscriptions*."

University B

The following responses were given by R1 from University B**:**

"*Honestly, the procedure for evaluating donated materials before their acceptance into the current collection comprises a series of phases. This evaluation is highly technical and requires ample time to assess the relevance and content of the materials. This careful consideration is crucial to ensure donations support the learning community."*

The respondent went on to explain that:

"As librarians, our task involves evaluating the physical condition of the materials, determining their relevance, and assessing their currency to understand their timeliness upon receipt. Additionally, we consider the subject areas to ensure that the donations will effectively enhance our collections."

"*Donations play a crucial role in reducing excessive pressures on the existing materials on shelves. One of the challenges we face is online books. We encounter poor power outages and inconsistent internet services during our operations."*

The respondent further explained that:

"These make the usage of online materials difficult. Online materials can support the scholarly works of lecturers and students. Integrating digital resources helps libraries to remain responsive to academic publishing and research."

"This approach enables libraries to enhance their collections without incurring the costs typically associated with printed materials. Feedback is crucial for evaluating the practical application of resources and addressing curriculum gaps. The evaluation process involves assessing the physical condition, relevance, and currency of the material to ensure they support core objectives and timeliness upon receipt."

Objective 3: Challenges posed by donated materials to academic libraries

University A

On the challenges, respondent R1 from University A expressed that:

"Honestly, donated materials posed challenges to libraries. Donated materials come with stringent conditions that hinder our operations. Some materials that are not academic focus or curricular scope are not accepted. Library management also rejects print materials that are damaged, outdated, substandard, or in poor condition. Accepting such items could incur additional costs for repair or restoration."

Another respondent from University **A (R2) recounted that:**

"Our library lacks a distinct policy regarding donations. However, we welcome high-quality gifts or donations. We examine the relevance of donated materials to ensure that they meet our needs. Materials donated to academic libraries have become a challenge. Interestingly, these materials come in large quantities."

The R2 added the following that:

Unsolicited donations occupy space without contributing to our services. In my view, they are wasted resources. We have an evaluation process that helps us accept only relevant materials. We examine the relevance of donated materials to ensure that they meet our scope."

University B

University B (R1).

The R1 from University B responded that:

"Donations have become burdensome due to limited space and inadequate storage capabilities, and the poor condition of many donated items. Managing obsolete or damaged materials requires extra resources, and removing outdated items is necessary to maintain a relevant collection- all of which present significant challenges for the library."

The respondent added that:

"Past donations led to insect infestations which were difficult to control due to funding delays. The current collection development policy guides management. There is a need for a separate donation policy to ensure alignment with library goals and improve decision-making. The respondent also highlighted challenges with donor expectations, such as demands on how donated materials should be displayed, which may conflict with library policies. "

University B (R2).

These are additional details offered by the respondent:

"*The respondent noted these: "While donated materials can enrich library collections, they also come with several challenges. These include duplication of existing resources, a lack of proper cataloguing, an increased workload for technical staff, and potential legal issues such as ownership, copyright, or licensing."*

"Additionally, some donations have led to pest infestation, requiring urgent preservation. The care of certain materials, especially rare or outdated formats, can also be resource–intensive. Sir, we are always careful and selective in accepting donations. "

Discussion of Results

This section of the study presents an analysis, interpretation, and findings derived from the research. The study assessed the impact of donated materials on academic library services in selected university libraries in Ghana.

Types of donations received by academic libraries

The study found that both university libraries accept various donations and gifts. The results revealed that the libraries obtain materials from individuals, organisations, and associations to support libraries in bridging gaps in subject areas. The findings corroborate similar studies by Akussah et al. (2025), that Ghanaian academic libraries prioritise books and technology-related items as donations, along with journals, digital content, and academically relevant materials.

The implication is that in the absence of well-defined donation policies and assessment procedures, libraries may inadvertently clutter their collections with materials that lack relevance, potentially compromising the quality of the collection and diminishing user satisfaction. Similarly, the findings are consistent with Patricia's (2009) observation that many libraries across Africa rely heavily on book donations and various financial support from individuals and organisations to sustain their operations.

Assessment of the impact of donations on academic library services

The study explored the impact of donated materials in selected university libraries in Ghana. The findings revealed that both university libraries acknowledged the importance of donations to their libraries' collections. These results corroborate the findings of studies by Emanuel (2014; Gregory, 2011), which underscored the need for academic libraries to carefully consider donations, as they can have both positive and negative effects on their operations. Similarly, Shehu et al. (2022) asserted that the primary responsibility of an academic library in its selection and collection is to ensure that the materials effectively support the interconnected functions of teaching, preservation, and research, both now and in the future. If donations and gifts do not align with academic requirements, they may prove ineffective in achieving their intended goals. Therefore, policies and collaboration are needed to improve their impact.

Challenges posed by donated materials to academic libraries

Participants from the two universities indicated that the donated materials frequently do not align with the academic missions, curricular focuses, or collection needs. The participants mentioned that donations sometimes arrive with incomplete cataloguing information, which adds to the workload of librarians and technical services staff. The results of this study tend to reinforce research by Edem (2010) that some donated materials do not have enough subject coverage while others were in foreign languages. The findings align with Frempong-Kore (2020), who asserted that academic libraries often receive donations that are obsolete, come with restrictive conditions, require re-cataloguing, do not match curricular needs, or are in languages that may be difficult for users to understand.

Conclusion and Recommendations

Donated materials play a significant role in supporting academic library services by supplementing existing collections and addressing resource gaps. However, their impact is most effective when donations align with the library's goals, curriculum needs, and quality standards. When donations are outdated, irrelevant, or come with restrictive conditions, they can strain library

resources, requiring additional processing, storage, and staff time. Academic libraries must scrutinise incoming donations to ensure that they support the library's mission and user needs. Libraries should establish and enforce clear guidelines to assess the suitability of donated materials. Donated materials should support the curriculum and research goals of the university. Libraries should evaluate materials before acceptance to avoid irrelevant or outdated content. Libraries should equip staff with skills to manage, evaluate, and integrate donations efficiently. They can also collaborate with the various organisations for assistance. Libraries should consult donor agencies for relevant and quality materials to enhance their services. Academic libraries are encouraged to conduct regular needs assessments and implement systematic evaluation procedures for donated materials. Librarians should feel empowered to decline donations that dot add value to existing collection. The study suggested that the library should solicit digital resources from donors. Additionally, in response to technological advancements, libraries should establish platforms for engaging with donors to foster stronger ties. There should be periodic evaluation of donated items to ensure that only relevant and useful materials remain in the collection.

References

Akussah, M., Acheampong, D., Adu-Sarkodee, R., & Asante, E. (2025). Collection development policy in academic libraries: The dilemma of donations of library resources in Ghana. *International Journal of Social Sciences and Management Research,* 8 (3). https://doi.org/10.37602/ijssmr.2025.8331

Alam, A. (2022). Platform utilising blockchain technology for eLearning and online education for open sharing of academic proficiency and progress records. In *Smart Data Intelligence*, 307–320, Springer.

Ajibola, S. G., & Kolawole, S. A. (2021). Review of academic library information and human resources: evidence from Osun State University, Nigeria. *Annals of Spiru Haret University, Economic Series,* 21(3), 192–208.

Arshad, A., Ameen, K., & Arshad, S. (2021). Collection development practices and use of print books in academic libraries of Pakistan. *Qualitative and Quantitative Methods in Libraries*, 10(1), 99–127. http://qqml-journal.net/index. php/qqml/ article/ view/697/625

Arthur, M. (2009). Learning to love gifts: how one library has increased efficiency in processing, and realized the benefits of gift materials. *Proceedings of the Charleston Library Conference.* http://dx.doi.org/10.5703/1288284314787

Edem, M.B. (2010). Gifts in university library resource development in the information age. *Collection Building.* https://doi.org/10.1108/01604951011040161

Emanuel, M. (2014). Managing in-kind gifts with getting it started toolkit's gifts and deselection manager. *Library collections, acquisitions, & technical services*, 38(1-2), 21-27.

Frempong-Kore, A. (2020). The role of donation on the collection development in Ghana communication technology university library. *International Journal of Arts and Social Science*, 3(6), 110-118.

Gregory, V. L. (2011). *Collection development and management for 21st century library collections: An introduction*. Neal-Schuman.

Jan, S., & Ganiae, S. A. (2019). Trends in collection & collection development practices in university libraries with a particular reference to India and other developing countries: A review of literature. *Library Philosophy and Practice (e-journal)*.https://digitalcommons.unl.edu/libphilprac/2510

Johnson P (2009). *Fundamentals of collection development and management*. — 2nd ed. American Library Association.

Johnson, P. (2004). *Fundamentals of collection development and management*, American Library Association, Chicago, IL.

O'Hare, S. & Smith, A. (2011). Gifts nobody wants: the state of the art in dealing with unwanted donations. *Kansas Library Association College and University Libraries section proceedings*, 1(1).

Lietaer, M. (2008). Please give generously! Handling donations to libraries. *Art Libraries Journal*, 33, Issue (4). 33 – 38. doi: https://doi. Org/10.1017 /S030747 2200015601

Onyeike, V.C. & Eseyin, E.O. (2014). Tertiary Education Trust Fund (TETFUND) and the management of university education in Nigeria. *Global Journal of Educational Research*, 13, 63-72.

Patricia O.I. (2009). *Financing of African University Libraries: An Overview of the Nigerian Situation.* 62nd IFLA General Conference - Conference proceeding.

Shehu, H., Imran, A. A., & Ojo, A. R. (2022). Challenges of utilizing library res
ources by students in federal polytechnic Nasarawa state. *Library Progress (International*), 42 (1), 11–18.

Sisimwo, J., Chege, F. N., Odanga, H., Masita, R. K., Abbas, A. W., Muchoki, I. W., & Matoke, D. B. (2016). *Electronic resources and its application in collection development practices in academic libraries*: the case of United States International University (Doctoral dissertation, Department of Library and Information Science, University of Nairobi).

Sturges, P. (2014). *Donations to Libraries: a problem in international cooperation*. doi: 10.4018/978-1-4666-4365-9.ch003

Sturges, P., & Gastinger, A. (2014). Libraries, donations and freedom of expression: The case of Scientology. *Journal of Librarianship and Information Science*, 46(1), 32-40.

Thomas, W. J., & Shouse, D. (2014). This is not a dumpsite: The problem of evaluating gift books. *Library Collections, Acquisitions, & Technical Services*, 38(3-4), 63- 69.

Walters, W. H. (2013). E-books in academic libraries: challenges for acquisition and collection management. *Libraries and the Academy*, 13 (2), 187–211.

PROCESSING AND ORGANIZATION OF STUDENTS' ACADEMIC RECORDS IN THE FACULTY OF EDUCATION, AHMADU BELLO UNIVERSITY, ZARIA

USMAN, ABBA
Ahmadu Bello University, Zaria, Nigeria

Abstract

This study examined the Processing and Organization of Students' Academic Records in the Faculty of Education, Ahmadu Bello University, Zaria. The objectives were to identify the procedure used for processing students' academic records in the Departments of Faculty of Education, Ahmadu Bello University, Zaria, and find out the arrangement system used for students' academic records in the Departments of Faculty of Education, Ahmadu Bello University, Zaria. A quantitative research methodology was employed, and a cross-sectional survey research design was used for the study. The population comprised eighty-five (85) administrative, clerical staff and examination officers handling academic records within the eight (8) Departments, the Deans Office, and the Central Academic Office, Main Campus, A.B.U, Zaria. A total enumerative sampling technique was adopted, i.e., the entire population of 85 was used. An open-ended self-developed questionnaire was used to collect data from the respondents. Descriptive statistics was used to analyse the data collected from the respondents, and a benchmark of 50% and above was regarded as positive and accepted, while items with below 50% were considered negative. The study revealed that the in-person requests method is the most common method being used in processing academic records in the Faculty of Education, A.B.U., Zaria, and Alphabetical and Numeric orders are the most common arrangement systems used in arranging students' academic records in the Faculty of Education, A.B.U., Zaria. The study concluded that the current method of Processing and organization of students' academic records in the departments, Faculty of Education, Ahmadu Bello University, Zaria, relies predominantly on manual processes, specifically direct in-person requests. While there are indications of an electronic system introduction, the need for intensified efforts is evident. It was, therefore, recommended that the management of Ahmadu Bello University, Zaria, should move the web address or transcript link to the university's main website to form a centralized digital platform to streamline and enhance accessibility for both online and in-person record requests. Also, the management of Ahmadu Bello University, Zaria, should incorporate a strategic mix of alpha-numeric-based methods, and the ones in place should be consistently used according to the records arrangement standard, as long as they facilitate easy records retrieval.

Keywords: Academic, Academic Records, Ahmadu, Bello, Education, Faculty, Organization, Processing, Students, University, Zaria

Introduction

In the contemporary academic environment, the efficient processing and organization of the students' academic records are central to the effective delivery of services in higher institutions. Student academic records serve as vital documentation of a learner's educational journey, containing essential information such as admission status, grades, transcripts, and degree certifications. These records not only support decision-making at both departmental and

administrative levels but also enable the institution to uphold accountability and transparency in academic processes (Abdullahi, 2021).

Record processing procedures vary across institutions but typically include request channels such as online request systems, in-person visits, email communication, postal services, and, in some cases, the use of third-party agents to facilitate document retrieval or delivery. These methods are expected to align with institutional policies that prioritize both convenience and security of information. According to Abdulrahim and Agada (2022), adopting multiple channels for records processing ensures inclusive access for diverse categories of students and graduates. However, the degree to which these procedures are standardized and consistently applied within departments remains a subject of concern, especially in developing contexts.

Furthermore, the organization of academic records within departments is a core component of records management. Proper arrangement enhances retrieval efficiency, reduces misplacement, and improves record preservation. Common classification methods include alphabetical order, chronological order, numerical or student ID-based order, subject-based organization, geographic grouping, and alphanumeric systems. As noted by Ailakhu (2021), using structured arrangement strategies enables institutions to adapt to increasing information demands while maintaining compliance with regulatory standards. However, challenges such as staff shortages, inadequate training, and inconsistent application of filing methods often limit the effectiveness of these systems. Given these considerations, the present study focuses on identifying the procedures used in processing and arranging students' academic records within the departments of the Faculty of Education at A.B.U., Zaria.

Statement of the Problem

Ideally, academic records in university faculties are expected to be processed and organized using standardized procedures that ensure timely access, accuracy, confidentiality, and long-term preservation. These records ranging from admission letters to transcripts, results, certificates, and research documents serve as the foundation for academic decision-making, graduate verification, and institutional accountability (Abdullahi, 2021). In a functional system, requests for such records should be efficiently managed through diverse channels such as online platforms, email, in-person visits, and authorized third-party services. Furthermore, organizing records using systematic methods like alphabetical, chronological, or numeric order facilitates easy retrieval and ensures compliance with institutional and regulatory frameworks (Ailakhu, 2021).

However, in practice, many Nigerian universities continue to struggle with inconsistencies in processing and organizing academic records. Although Abdulrahim and Agada (2022) highlighted that records processing in some faculties within A.B.U. had adopted multiple request channels, the extent to which these channels are used effectively remains unclear. Similarly, Allison (2021) found that despite the availability of record arrangement techniques like chronological and alphanumeric ordering, their actual implementation across university departments is inconsistent, often due to inadequate staff training and lack of institutional enforcement mechanisms.

Objectives of the Study

The objectives of the study were;

1. To identify the procedures used for processing students' academic records in the Departments of Faculty of Education, Ahmadu Bello University, Zaria
2. To identify the arrangement system used for students' records for processing of academic records in the Departments of Faculty of Education, Ahmadu Bello University, Zaria?

Literature Review

The processing of students' academic records in universities involves a variety of methods designed to facilitate access, ensure authenticity, and maintain data integrity across different user needs and institutional capacities. With advancements in technology and increasing demand for efficient service delivery, universities now employ multiple approaches to handle requests for academic records such as transcripts, certificates, and admission documents. One of the most widely adopted methods in contemporary academic record processing is the online request system. This method allows students and graduates to request transcripts, statements of results, or certificates through university portals or dedicated online platforms. According to Mubofu, Mambo, and Samzugi (2020), digitization of academic services including the processing of student records—has enhanced institutional efficiency and accessibility, especially in universities that have adopted electronic records management systems. Online platforms are particularly beneficial in reducing turnaround time and providing 24/7 accessibility, especially for alumni residing outside the institution's locality. Despite the widespread adoption of digital tools, many universities still accommodate in-person requests for academic records. This traditional method requires students or their representatives to physically visit the registry or academic records office. Ejiroghene (2020) noted that in several Nigerian universities, in-person interactions are still considered essential, particularly in environments where digital infrastructure is underdeveloped or where trust in digital systems remains low. However, this method can be time-consuming and may not cater effectively to long-distance applicants.

Processing academic record requests through postal mail remains a viable option, especially for formal, certified document submissions. In some cases, institutions require or offer the option to mail hard copies of academic records to institutions abroad, employers, or accrediting bodies. While mail services are slower and susceptible to delays, Usiedo et al. (2022) emphasized that they still provide a dependable channel for official record exchanges, particularly when original hard copies are mandatory. The use of institutional email addresses for record requests has become increasingly common, especially in universities where full digital systems have not been fully deployed. Email requests allow for a faster, semi-digital communication process between students and the records office. According to Ilo, Nkiko, Izuagbe, and Furfuri (2020), email-based requests have helped bridge the gap between manual and digital systems, serving as a transitional strategy while universities upgrade to more robust electronic records management systems.

Some universities also authorize third-party services to process academic record requests on behalf of students. These services may include certified courier companies, educational verification agencies, or secure online platforms such as Digitary or National Student Clearinghouse (in more technologically advanced contexts). In the Nigerian context, Abdullahi

(2021) found that some institutions collaborate with secure third-party vendors to verify student qualifications and transmit transcripts, especially for international admissions or employment verification. However, concerns over data security and consent often arise with the use of external parties. Therefore, universities use a combination of online platforms, in-person visits, email, mail, and authorized third-party services to process students' academic records. Each method has its strengths and limitations, and the effectiveness often depends on the institution's technological maturity, administrative structure, and user preferences.

The organization of students' academic records is a critical component of effective records management in higher institutions. Proper arrangement ensures quick retrieval, security, and systematic archiving of information, which are essential for administrative efficiency and academic accountability. Universities adopt a range of filing and arrangement procedures based on institutional preferences, volume of records, type of records, and available resources. According to Nwalo (2018), a well-structured records arrangement system enhances the speed and accuracy of information retrieval and supports decision-making processes within academic institutions. Alphabetical arrangement is one of the most commonly used procedures, especially for student files and admission records. This method involves organizing records based on students' last names (or first names, in some cases), making it easy for administrative staff to locate files manually or digitally. Osakwe (2020) highlights that alphabetical filing is particularly useful in departments with a large number of students, as it simplifies the process of locating individual records without requiring advanced technological systems. However, it can be less efficient when names are very similar or misspelled.

Chronological arrangement refers to organizing records based on dates, such as the year of admission, graduation, or examination. This method is often used for tracking academic progress, organizing transcripts, and maintaining archived student results. According to Shehu (2021), chronological filing is essential for monitoring historical trends in student performance and maintaining a sequential audit trail of academic records. It is also valuable during accreditation exercises when records need to be traced back to a specific academic session.

In numeric filing, records are arranged using unique identification numbers such as matriculation numbers or admission numbers. This method ensures precision and reduces ambiguity in identifying students, especially in institutions with thousands of records. Egwunyenga (2021) observed that numeric systems are particularly effective when integrated with digital record-keeping platforms, where each student is assigned a unique code that links to all their academic information. However, this method requires a robust indexing or cross-referencing system to be effective manually.

Subject order arrangement involves grouping academic records according to specific academic disciplines or course codes. This method is most applicable in organizing students' projects, theses, or departmental journals. According to Afolabi and Adediran (2020), subject-based filing is especially useful for academic staff and researchers who may need to access documents within a particular field of study. It supports thematic organization and helps departments maintain specialized knowledge repositories.

Although less common, geographic arrangement is used to group records based on students' regions of origin, states, or countries. This method is often relevant for demographic analysis, scholarships, or quota-based admission policies. Adamu (2019) noted that universities occasionally organize admission and alumni records geographically to fulfill national integration mandates or monitor state-level educational contributions. However, this method is typically used in combination with other primary filing systems.

The alpha-numeric system is a hybrid of alphabetical and numerical arrangements. Records are classified using combinations of letters and numbers, such as "EDU/2019/0045." This method is highly structured and supports both manual and electronic filing systems. According to Igbokwe and Nwosu (2022), alpha-numeric arrangements provide a flexible yet secure way of categorizing academic records, particularly when institutions seek to integrate alphabetical indicators (e.g., department codes) with numerical sequences (e.g., year of admission). It enhances data precision and is widely used in institutions with automated records management systems. Therefore, the choice of procedure for arranging students' academic records depends on the nature of the records, institutional capacity, and retrieval needs. A combination of these methods is often used to optimize accessibility and integrity of academic records.

Methodology

The research adopted the quantitative approach and cross-sectional survey research design. The population consist of all the Administrative Officers, Clerical Officers, Examination Officers and their Assistants in the Departments, Deans' office of the Faculty of Education, and the central academic office of Ahmadu Bello University, Zaria totaling 85. A total enumerative sampling technique was adopted, i.e., the entire population of 85 was used. A Self-developed questionnaire was used as the instrument for data collection. Eighty five copies of the questionnaire were administered to respondents out of which eighty were retrieved with complete information making a percentage response rate of 94.1% used for the study. Analysis of the collected data involves utilizing frequency distribution and percentages. A benchmark of 50% and above was regarded positive and accepted, while items with less than 50% was regarded negative.

Result and Discussion

Procedures used in processing of academic records in Departments of Education and the Central academic office of Ahmadu Bello University, Zaria

The researcher find out the methods used in processing academic records in Departments, Dean's office, Faculty of Education and the Central academic office of Ahmadu Bello University, Zaria. A List of methods of processing academic records in Universities and other Institutions of higher learning was provided for them to select which is or are applicable to. Table 1 presents the data collected and analysed accordingly.

Table 1: Procedures used in Processing Academic Records in Departments, Dean's office, Faculty of Education and the Central Academic Office of Ahmadu Bello University, Zaria

S/No	Procedure	Frequency (F) & Percentage (%)
1.	Online request	30(37.5)
2.	In-person request	70(87.5)
3.	By mail	20(25.0)
4.	By email	20(25.0)
5.	The use of third-party service	0(0.0)

Source: field survey, (2025)

Table 1 outlines the procedures utilized for processing academic records within the departments, Dean's office, Faculty of Education and the central academic office of Ahmadu Bello University, Zaria. The result indicates the prevalence of multiple methods for processing these records. The most common approach appears to be in-person requests, constituting a substantial 70 (87.5%), this is followed by online requests which has 30 (37.5%) of the total population, followed by mail and email which has 20 (25.0%) each. Finally, there is no department or unit that uses the third-party services. The findings also resonate with the work of Osei-Bonsu, as cited in Ameyaw & Frempong-Kore (2021), who identified a similar trend at the University of Ghana, showcasing a commonality in the reliance on personal engagement for academic record handling across different institutions. The minimal use of email and mail methods further underscores this inclination, emphasizing the importance of face-to-face interactions. The absence of third-party services raises questions about their availability or accessibility at Ahmadu Bello University, contrasting with the recognized effectiveness of such services highlighted by Olarewaju (2022).

Overall, these results shed light on the prevailing practices at the institution, emphasizing a combination of conventional and digital methods with a significant emphasis on personal engagement in academic record processing. This implies that there is a strong reliance on traditional, direct interaction-based approaches. This aligns with the observations of Omogbhemhe and Akpojaro (2018) in Nigerian higher institutions, emphasizing a prevalent preference for in-person request systems. The use of personal engement in the processing of academic records is time consuming, delay in retrieval process and financial burden compared to electronic method. This is in line with Chiwanza and Mutongi (2016).

Procedure used in Arranging Students' Academic Records in Faculty of Education and the Central Academic Office of Ahmadu Bello University, Zaria

In order to determine the method used in arranging Students' Academic Records in Departments, Dean's office, Faculty of Education and the Central academic office of Ahmadu Bello University, Zaria, a list of arrangement system was provided for them to choose which is or are applicable to them. Table 2 exhibited the data collected and analysed for such purpose.

Table 2: Procedures used in Arranging Students' Academic Records in the Faculty of Education and the Central Academic Office of Ahmadu Bello University, Zaria

S/No	Procedure	Frequency (F) & Percentage (%)
1.	Alphabetical Order	70(87.5)
2.	Chronological Order	20(25.0)
3.	Numeric Order	55(68.8)
4.	Subject Order	28(35)
5.	Geographic Order	0(0.0)
6.	Alpha-numeric Order	23(28.8)

Source: field survey, (2025)

Table 2 displays the various procedures employed in arranging students' academic records within the Departments, Dean's office, Faculty of Education and central academic office of Ahmadu Bello University, Zaria. The result reveals that the alphabetical arrangement order has 70 (87.5%) of the frequency, this is followed by numeric order which has 55 (68.0%) of the total population, Subsequently, Subject arrangement system followed up with 28 (35.0%) of the population, followed by, Alpha-numeric Order which has 23 (28.8%), this is followed by Chronological arrangement which has 20 (25.0%), and Finally, geographic order has 0.0(0.0%). From table 2, it shows that alphabetical and Numeric orders were the types of arrangement orders that are above the stated benchmark of 50%. This indicates they are on the positive side.

The results indicating some departments and units using alternative methods highlight the flexibility, security, and efficiency these methods may offer, albeit with potential resource requirements. Overall, these findings underscore the absence of a one size-fits-all approach to organizing academic records, emphasizing the need to tailor methods to suit different record types and purposes. This implies there is a strong preference for alphabetical organization within the departments, dean's office, faculty of education, and central academic office of Ahmadu Bello University, Zaria. This finding aligns with the observations of Read & Ginn (2011), who categorized records arrangement patterns into alphabetic, subject, numeric, and geographic methods, emphasizing the widespread use of alphabetical order. The corroboration with Mathew (2019) reinforces the prevalence of alphabetical arrangement as the most common and simple method, facilitating easy access and retrieval of records based on names or subjects.

Conclusion and Recommendations

It was concluded that the Faculty of Education at A.B.U. Zaria primarily relies on in-person requests for processing academic records, and students' records are most commonly organized using alphabetical and numeric ordering systems. The study recommended that the management of Ahmadu Bello University, Zaria, should move the web address or transcript link to the university main web site to form a centralized digital platform to streamline and enhance accessibility for both online and in-person record requests. The digitization of non-digital records should be emphasized to ensure a full integrated and efficient system. Furthermore, exploring secure third-party services is advised as a potentially effective option for the processing of academic records. The management of Ahmadu Bello University, Zaria, should incorporate a strategic mix of alpha-numeric based methods. Also, the ones in place should be consistently use according to records arrangement standard as long as it facilitates easy records retrieval.

References

Abdullahi, A. Y. (2021). *Management of students' records in academic departments of Hassan Usman Katsina Polytechnic, Katsina, Nigeria*. Hassan Usman Katsina Polytechnic.

Abdulrahim, A., & Agada, A. (2022). Assessment of records arrangement and utilization of finding aids for information retrieval in Faculty of Education, Ahmadu Bello University, Zaria. *Samaru Journal of Information Studies, 22*(1).

Adamu, M. A. (2019). *Records management practices in selected Nigerian universities*. Zaria: Ahmadu Bello University Press.

Afolabi, M., & Adediran, T. (2020). Filing systems and the challenges of academic records management in Nigerian universities. *Nigerian Journal of Library and Information Science, 21*(1), 45–53.

Ailakhu, U. (2021). Records management effectiveness in registries of open and distance learning institutions. *Madonna Journal of Research in Library and Information Science, 4*(3), 68–86.

Allison, G. O. (2021). Records management practices and job performance of registry staff of universities in Ogun State, Nigeria. *International Journal of Academic Management Science Research (IJAMSR), 5*(9), 69–78.

Ameyaw, S., & Frempong-Kore, A. (2021). Records Management Practices In Ghanaian Tertiary Institutions: A Case Study Of Ghana Communication Technology University. UDS International Journal of Development, 7(2), 461–472. https://doi.org/10.47740/503.UDSIJD6i

Chiwanza, K. & Mutongi, C. (2016). Managing quality through records management in open and distance learning institutions. *The International Journal of Engineering and Science (IJES),* 5(12), 63-70.

Egwunyenga, E. J. (2021). The management of student academic records in higher institutions: Problems and prospects. *Journal of Educational Research and Development, 5*(2), 112–120.

Ejiroghene, E. R. (2020). Preservation and conservation of library materials in the digital age: Challenges for libraries in Nigeria. *Library Philosophy & Practice*.

Igbokwe, J. O., & Nwosu, B. C. (2022). A review of classification and filing techniques in Nigerian university registries. *Library Philosophy and Practice*, 1–15.

Ilo, P. I., Nkiko, C., Izuagbe, R., & Furfuri, I. M. (2020). Librarians' perception of disaster preparedness as precursor for effective preservation and conservation of library resources

in Nigerian university libraries. *International Journal of Disaster Risk Reduction*, *43*, 101381. https://doi.org/10.1016/j.ijdrr.2019.101381

Mathew, O. S. (2019). Records Organizing and Processing / RIM1202. [Course material]. Retrieved from the University of Cape Coast (UCC) database.

Mubofu, C., Mambo, H., & Samzugi, A. (2020). Academic libraries and information resources preservation strategies: Past, present and the way forward. *Library Philosophy and Practice*. https://digitalcommons.unl.edu/libphilprac/4082/

Nwalo, K. I. N. (2018). *Fundamentals of library practices*. Ibadan: Stirling-Horden Publishers.

Olarewaju, B. (2022). How to Get Transcript Certificate from Nigerian University [online]. Available: https://studentship.com.ng/nigerian-university-transcript/

Omogbhemhe, M & Akpojaro, J (2018). Development of Centralized Transcript Processing System. Adegboyega University, Ogwa, Edo State, Nigeria. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS).* 235-243. https://www.researchgate.net/publication/337256757 Online

Osakwe, E. (2020). University administrative records management in Nigeria: The way forward. *Archives and Records*, *41*(3), 221–233. https://doi.org/10.1080/23257962.2020.1778369

Read, J. & Ginn, M. L. (2011). Records Management. 9th edition, www.cengage.com/officetech/read

Shehu, I. M. (2021). Enhancing records arrangement in tertiary institutions: A study of record-keeping systems in Northern Nigerian universities. *Journal of Records and Information Management*, *4*(1), 67–79.

Usiedo, B. A., Kalu, C. O., Nworie, J. C., & Ibeh, O. B. (2022). Preservation and conservation of library resources in Nigerian libraries: A review. *Communicate: Journal of Library and Information Science*, *24*(2).

UTILIZATION OF DIGITAL SKILLS FOR ENHANCED RESARCH AMONG POSTGRADUATE STUDENTS IN SELECTED FEDERAL UNIVERSITIES IN NORTHWEST STATES, NIGERIA

Dr. Friday James
Kaduna State University

Dr. David peter Dogara
Kaduna State College of Education Gidan Waya

Abstract

This study investigated the utilization of digital skills for enhanced research among Postgraduate Students in selected federal universities in Northwest, States Nigeria. The objectives were to ascertain the digital skills possessed for research by postgraduate students, examine the extent to which digital skills contribute to enhanced research of postgraduate students and identify the challenges inhibiting the acquisition of digital skills for enhanced research among postgraduate students in selected federal universities in Northwest, Nigeria. Descriptive survey design was adopted for the study. The population of the study is 5,320 Postgraduate Students in five selected federal universities in Northwest Nigeria. Sample size of 380 Postgraduate Students was drawn using proportional stratified random sampling technique. Data were collected using questionnaire and observation Check list. The instruments were face validated by two research experts. The questionnaires were trial-tested for reliability using Postgraduate Students of University of Nigeria, Nsukka. An overall reliability index of 0.74 was established using Cronbach's Alpha procedure. Descriptive statistics of mean and standard deviation were used to answer research questions. While t-test was used to test the hypothesis at 0.05 level of significance. The findings indicated that majority of postgraduate students possess computer skills, internet literacy skills, media literacy skills and information evaluation skills to a high extent, possessing high digital skills contribute to enhance research among Postgraduate students, major challenges inhibiting the use of digital skills for research among Postgraduate students in selected federal universities, Northwest of Nigeria among others are: inadequate of electronic information search skills, low internet bandwidth, erratic power supply among other are some and other that inhibiting acquisition skills. The study recommended that the federal university management should ensure that there is steady electric power supply in the university library, intensify training on truncating skills and Boolean be given priority by librarian. And constant electricity should be provided among others.

Key words: Digital skills; Electronic Information Resources; Postgraduate students; University; Utilization; Research, Northwest, Nigeria

Introduction

Research work remain one of the most crucial academic activities carried out in academic institutions. The application of computers as well as other information technologies to research work or investigation had brought several advantages, the most significant of which is ability to

transmit vast amounts of research findings or information speedily and accurately. Because of the need to access accurate and speedy information digital skills becomes crucial.

Operationally, digital skills are skills that are related to the abilities and mental skills associated to creating finding, organizing and assessing digital information. It is an ability to construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process using digital technologies (Vidosavljevic & Vidosavljevic, 2019). Importance of digital skills to students is becoming more apparent especially in the digital learning environment of the 21st century. It increases the usage of information and communication technologies facilitate access to information, increase in the amount of information that can be accessed and the facilitation of communication.

The interventions of the TET Fund also involved organizing workshops to equip students with digital skills so as to enhance their ability to effectively use electronic information resources to facilitate their research activities. Nonetheless, it has been noted that most postgraduate students at northwest federal universities produce shallow research. This is in line with what Okagbue, Opanuga, Oguntunde, Adamu, Iroham, Angie and Adebayo (2018), discovered that research outputs from the universities of technology in Nigeria were poor especially when compared with other African countries like Egypt, Morocco, and Ghana.

Statement of the Problem

Research plays a key role in recognizing and tackling challenges across various fields such as society, technology, health, and more. It empowers both individuals and organizations to develop solutions for intricate issues by offering insights grounded in evidence. To conduct an effective research, a researcher need to consult diverse information resources to access information needed. digital skills in accessing electronic information resources enhances quality of intellectual output through the provision of current and up-to-date information resources for users, most especially postgraduate students who are undertaking programmes that are research intensive. The researchers observed that although digital skills hold significant potential for addressing research, the benefits that research could provide remain uncertain and unresolved. It could be because of poor and shallow research and not using e-resources. Poor use of e-resources may be attributed to lack of digital skills. That is why the researcher needed to find these skills that are not adequately possessed to proffer solution to the shallow research.

Objectives of the study

The specific objectives of the study are to:

1. Ascertain the digital skills possessed for research by postgraduate students in selected federal universities in Northwest, Nigeria;
2. Examine the extent to which digital skills contribute to enhanced research of postgraduate students in selected federal universities in Northwest, Nigeria;
3. Identify the challenges inhibiting the acquisition of digital skills for enhanced research among postgraduate students in selected federal universities in Northwest, Nigeria.

Literature Review

Digital skills evolved from literacy development in this digital era in response to the development of technology and internet which makes people utilizes digital devices to access, share, and create information in digital form. Laura, Gianluca, Marco, and Luca (2016) noted that Internet digital skills have a positive impact on student performance by reducing the likelihood of using unreliable sources. It allows researchers and postgraduate to share and communicate research findings with colleagues.

Charles (2022) assessed the digital skills among graduates following the initiatives taken by the THEIs and their influence on self-employment. It specifically identified the digital skills and ranking the digital skills acquired by the graduates when in the THEIs. It likewise established relationship between digital skills and self-employment among the graduates. The data were collected using a questionnaire from 500 graduates sampled through a stratified random sampling technique. The collected data were analyzed using Descriptive Statistics. The findings show that, the graduates acquired basic digital skills (i.e. creating professional online profiles, word processing, using keyboards and touch-screens, managing privacy settings, emails) to the large extent (53%); intermediate digital skills (i.e. desktop publishing, digital graphic design, digital marketing) to the small extent (52%) and advanced digital skills (i.e. big data, artificial intelligence, digital entrepreneurship, cyber security, internet of things, virtual reality) to the very small extent (54%) when in the college/university. Furthermore, intermediate and advanced digital skills were ranked higher as digital skills for self-employment by the graduates. All three digital skills were found positive and significant for self-employment among the graduates in Tanzania. The study recommends that, the colleges, institutes and universities should emphatically inculcate all the digital skills to the students as they are both significant for self-employment of their respective graduates.

Equally, Ferninand, Nweke and Ochigbihi (2018), assessed the information skills acquired among College of Technology The primary goal of the study was to assess the information literacy abilities of FUPRE students at the Federal University of Petroleum Resources Effurun (FUPRE) college of technology. The study had three distinct goals: to determine the degree of awareness regarding the various kinds of information sources that are available in the university library; to investigate the different information searching strategies used by the students; to ascertain if students are familiar with databases that contains information resources useful to them; and to find out the purpose for which students uses information. Descriptive survey design was adopted for the study. The population for the study was 50 students each from 300 and 400 level students of the five departments, making a total population of 500 students of Technology Federal University of petroleum resources Effirnum (FUPRE). A sample size of 250 was sampled using a simple random sampling technique. The instrument used for the collection of the data was a structured questionnaire. Finding of the study revealed among others that majority of the students at the College of technology FUPRE have minimal knowledge on the use of databases, majority of students use librarians' assistance and search engines when retrieving information.

Oseghale (2023) carried a study; the purpose was to assess the level of digital skills (DIL) and use of electronic resources by humanities graduate students at Kenneth Dike Library, University of Ibadan, Nigeria. Survey research design was used. The population of the study was

200 graduate students from the 12 departments that made up the Faculty of Arts in the University of Ibadan participated in the study. The whole population was used for the study. A self-devised structured questionnaire was used as instrument for data collection. Respondents were requested to rate their level of proficiency in the use of digital devices, web-based tasks, information finding, evaluation and utilization of available e-resources and challenges encountered. Ethical consideration of informed consent, institutional permission, confidentiality, and anonymity of participants was strictly followed. Data collected were analyzed and result presented using descriptive statistics including frequencies, percentage, mean and inferential statistics such as regression analysis and Pearson's product moment correlation coefficient were used to test the research question and hypothesis, respectively. The Findings revealed that Humanities, graduate students at the University of Ibadan possessed high level of DIL skills in respect of digital devices usage, web-based tasks, information finding and evaluation, but low in e-resources utilization. The study identified inadequate knowledge of e-resources availability, irregular internet access, inadequate training on e-resources utilization, inadequate staff assistance, lack of continuity in e-resources subscription and paucity of local contents in the e-resources as main challenges encountered by graduate students in the use of e-resources.

Methodology

The study adopted quantitative methodology and descriptive survey design. It is considered appropriate for this study because it allows for the systematic collection, analysis, and interpretation of data to understand the current status of digital skills usage among postgraduate students. The population of this study comprised 5,320 Masters and Ph.D. students (3,308 male, 2,012 female) across five selected federal universities (Ahmadu Bello University, Zaria, Bayero University, Kano, Usman Danfodio, University Sokoto Federal University Birnin Bebbi and Federal University Gusau, Zamfara State) in the North West states of Nigeria . The sample size is 380 Postgraduates students. The study adopted proportionate stratified random sampling techniques in the selection of the samples. Questionnaire and observation checklist were the instruments used for data collection and was personally administered with help of two research assistants. Descriptive and inferential statistics were used to analyze the data for all the research questions.

Result and Discussion

Research Objetive: 1

Ascertain the digital skills possessed for research by postgraduate students in selected federal universities in Northwest, Nigeria;

Table 1
Mean Responses on the Digital skills Possessed by Postgraduate students for Research in Selected Federal Universities in Northwest, Nigeria

S/N	Item Statement	VHP	HP	LP	NP	Mean	St.D	D
1	copy and paste files	201	124	9	4	3.54	.611	**VHP**
2	To determine the currency of the e-resources	235	67	20	16	3.54	.808	**VHP**
3	To verify the authenticity of the source of the e-resources	223	81	23	11	3.53	.763	**VHP**
4	creating professional online profiles,	226	79	20	13	3.53	.774	**VHP**
5	Use of keyboard, mouse, and disk management.	182	150	5	1	3.52	.546	**VHP**
6	using media to communicate	232	66	22	18	3.51	.838	**VHP**
7	Skills to determine the authority of the writer of e-resources	223	80	20	15	3.51	.798	**VHP**
8	Ability to determine the mode of presentation of the work	216	93	13	16	3.51	.783	**VHP**
9	Avoiding harmful media content and services	216	85	28	9	3.50	.760	**VHP**
10	working with Microsoft office, Microsoft word, power point, etc.	175	175	9	0	3.49	.551	**HP**
11	Skills to access on-line databases	174	154	10	0	3.49	.557	**HP**
12	use of author search for electronic catalogue (OPAC) search.	172	156	8	2	3.47	.577	**HP**
13	skill of browsing the internet to locate needed information	210	90	24	14	3.47	.801	**HP**
14	skill to compose, send, open, read, reply to and forward messages	213	82	27	16	3.46	.833	**HP**
15	Use media tools in online participation	217	78	26	17	3.46	.841	**HP**
16	copying information from computer into your storage device such as flash drive and diskette	168	154	16	0	3.45	.586	**HP**
17	skill of download and upload information on internet	211	88	17	22	3.44	.860	**HP**
18	use of search engines such as Yahoo, Google, Alta Visa, and Google scholar etc.	156	172	10	0	3.43	.553	**HP**

19	Using media tools such as, computers, iPad and Mobile phone, television, and radios.	212	76	34	16	3.43	.856	**HP**
20	Combining two terms to retrieve information.	136	196	6	0	3.38	.522	**HP**
21	skill of attaching files and open an attachment	199	90	22	27	3.36	.918	**HP**
22	skill of using keywords	89	43	157	49	2.51	1.03	**HP**
23	skill of Boolean operators	88	37	165	48	2.49	1.03	**LP**
24	digital graphic design	39	52	213	34	2.28	.798	**LP**
25	desktop publishing	25	69	213	31	2.26	.725	**LP**
26	**skill of truncation**	**29**	**37**	**249**	**23**	**2.21**	**.690**	**LP**

Key: VHP = very Highly Possess, HP= Highly Possess, LP = Less Possess, St.D = Standard Deviation, D = Decision

The data presented on table 1 shows the mean responses of postgraduate students on the digital skills possessed for research in the selected federal universities in Northwest, Nigeria. The results shows that copy and paste files skills and currency of the e-resources skills are the most high rank skills by the postgraduate students for enhanced research in federal universities in Northwest, Nigeria with 3.54 mean score each, while the digital skills possesses by the postgraduate students that ranked least is skill of truncation with a mean score of 2.21. This revealed that the respondents were close to one another in their opinion regarding the digital skills they possess for effective research.

The study found out that, majority of postgraduate students possess computer skills, internet literacy skills, media literacy skills and information evaluation skills to a high extent. These skills are the required skills to use media tools in online participation, verify the authenticity of the source of the e-resources, attach and open files, use of media tools such as, computers, iPad and mobile phone, television, determine the authority of the writer of e-resource. On the other hand, majority of the postgraduate students are less competent in some information retrieval. The findings is in accordance with that of Onah, Adayi, Okonkwo, & Onyebuchi (2020) who found out that students possess basic digital skills for information retrieval, however, lacks skill of Boolean operators and skill of truncation. The finding is in line with that of Gakibayo et al (2016), they submitted that to make use of the growing range of electronic resources, students must acquire and practice the skills necessary to exploit them. They further emphasized that students demonstrate stronger information skills compared to other skills, such as operational and strategic skills. The findings showed that, digital skills such as computer skills, internet literacy skills, media literacy skills and information evaluation skills contribute in enhancing research among postgraduate students in federal universities in Northwest, Nigeria. The findings is in agreement to the findings of Friday, Ovwasa, and Onyenwenu, (2024) who discovered that digital literacy

positively influenced librarians' research productivity, even though the influence was not significant.

Research Objectives: 2

Examine the extent to which digital skills contribute to enhanced research of postgraduate students

Table 2

Mean Responses on the Extent to which Digital Skills Contribute to Research of Postgraduates Students.

S/N	Item Statement	VHE	HE	LE	VLE	Mean	St.D	D
1	Combining two terms to retrieve information contribute for research development	332	6	0	0	3.98	.132	**VHE**
2	Access of on-line databases aids writing research	326	12	0	0	3.96	.185	**VHE**
3	To determine the currency of the e-resources for research development	274	52	7	5	3.76	.560	**VHE**
4	desktop publishing for research development	262	56	20	0	3.72	.568	**VHE**
5	To verify the authenticity of the source of the e-resources for research development	240	98	0	0	3.71	.454	**VHE**
6	Using media tools such as, computers, iPad and Mobile phone, television, and radios. for research development	251	67	20	0	3.68	.579	**VHE**
7	Skills to determine the authority of the writer of e-resources for research development	237	96	5	0	3.67	.557	**VHE**
8	creating professional online profiles, for research development	237	82	19	0	3.64	.585	**VHE**
9	Attach files and open an attachment for research development	230	91	17	0	3.63	.578	**VHE**
10	using media to communicate for research development	213	118	7	0	3.61	.529	**VHE**
11	Boolean operators help in searching relevant information for research writing	245	52	30	11	3.57	.787	**VHE**
12	Download and upload information on internet for research development	204	84	50	0	3.46	.739	**HE**
13	Keywords aids in searching relevant information for research writing	200	87	35	16	3.39	.856	**HE**
14	Truncation skills assist in searching information for easy research	190	101	24	23	3.36	.884	**HE**
15	digital graphic design for research development	155	140	43	0	3.33	.691	**HE**
16	Browse internet to locate needed information enhance accessing to information for research writing	174	110	42	12	3.32	.825	**HE**
17	Use media tools in online participation for research development	149	149	40	0	3.32	.676	**HE**

18	Copy and paste files skill is use for research development	181	89	56	12	3.30	.870	**HE**
19	The skill of Use of keyboard, mouse, and disk management skill contribute for research writing	162	124	41	11	3.29	.804	**HE**
20	Avoiding harmful media content and services for research development	170	107	51	10	3.29	.830	**HE**
21	Use of author search for electronic catalogue (OPAC) search contribute for research development	212	38	59	29	3.28	1.03	**HE**
22	Working with Microsoft office, Microsoft word, power point helps for research development	117	159	46	16	3.12	.813	**HE**
23	Ability to determine the mode of presentation of the work for research development	124	140	57	17	3.10	.854	**HE**
24	Compose, send, open, read, reply to and forward messages for research development	144	128	11	55	3.07	1.05	**HE**
25	Copying information from computer into your storage device such as flash drive and diskette contribute for research development	115	123	59	41	2.92	.999	**HE**
26	Use of search engines such as Yahoo, Google, Alta Visa, and Google scholar, contribute for research dev.	89	124	79	46	2.76	.993	**HE**
	Cluster analysis mean	194	65	64	15	3.30	.832	**HE**

Key: VHE= Very Highly Extent, HE = Highly Extent, St.D = Standard Deviation, D= Decision

The data presented on table 2 revealed that the mean responses of postgraduate students on the extent to which digital skills contribute to effective research of postgraduate students in the selected federal universities, Northwest of Nigeria. The results shows that item 1-11 with mean score ranging from 3.98 to 3.57 are very high extent to which digital skills contribute to effective Research. However, the mean score of items 12-26 which range from 3.46 to 2.76 are high extent to which Digital skills contribute to effective research. The digital skills that contribute to effective research of Postgraduate students to high extent is combining two terms to retrieve information ranked highest with 3.98 mean, while the least rank is the use of search engines such as Yahoo, Google, Alta Visa, and Google scholar, contribute to effective postgraduate research with 2.79 mean score. The analysis showed a cluster mean rating of ($\bar{x}$ = 3.30) which indicate that digital skills contribute to enhancing research of postgraduate students at high extent.

The study found out that, possessing high digital skills contribute to enhance research by Postgraduate students in Federal Universities, Northwest of Nigeria. The findings showed that, digital skills such as computer skills, internet literacy skills, media literacy skills and information evaluation skills contribute in enhancing research among postgraduate. The findings is in agreement to the findings of Friday, Ovwasa, and Onyenwenu, (2024)who discovered that digital literacy positively influenced librarians' research productivity, even though the influence was not significant. The findings is also in accordance with that of Tagwai, Pam, Akamonye, Igwe, and Anyanwu, (2023) who found out that digital skills facilitate and enhanced research through effective retrieval of required electronic information resource.

Research objective: 3 examine the extent to which digital skills contribute to enhanced research of postgraduate students;

Table 3

Mean Responses on the Challenges inhibiting the use of Digital skills for Research among Postgraduate students in selected Federal Universities, Northwest of Nigeria

S/N	Item Statement	SA	A	D	SD	Mean	St.D	D
1	Inadequate of continuity in e-resources subscription constrain the use of digital skills	222	95	19	2	3.59	.625	**SA**
2	Slow internet connectivity is hindering the use of digital skills	215	110	7	6	3.58	.627	**SA**
3	Inadequate of Electronic information search skills inhibiting the use of digital skills	218	102	6	12	3.56	.705	**SA**
4	Low internet bandwidth is inhibiting the use of digital skills	217	103	6	12	3.55	.705	**SA**
5	Erratic power supply is hindering the use of digital skills	214	105	7	12	3.54	.710	**SA**
6	Complexity of online resources inhibiting the use of digital skills	203	121	2	12	3.52	.690	**SA**
7	Inaccessibility of ICT facilities constrain the use of digital skills	205	110	17	6	3.52	.677	**SA**
8	Inadequate numbers of available computers inhibit the use of digital skills	199	113	20	6	3.49	.690	**A**
9	Inadequate of computer literacy deter the use of digital skills	199	118	3	18	3.47	.767	**A**
10	Inadequate of information literacy is hindering the use of digital skills	202	97	27	12	3.45	.789	**A**
11	Technophobia constrains the use of digital skills	203	98	19	18	3.44	.825	**A**
12	Cost of training is hindering the use of digital skills	197	102	15	24	3.40	.870	**A**
13	Inadequate of IT infrastructures is hindering the use of digital skills	197	94	29	18	3.39	.855	**A**
14	Poor Postgraduate students' attitude to the use of EIRs inhibiting the use of digital skills	131	200	7	0	3.37	.524	**A**

Key: SA = Strongly Agree, A = Agree, St.D = Standard Deviation, D= Decision

The data presented on table 3 revealed the mean responses of postgraduate students on the challenges inhibiting the use of digital skills for research in the selected federal universities, Northwest of Nigeria. from the results, the major challenges are Inadequate of continuity in e-resources subscription, with 3.59 mean score; Slow internet connectivity, with 3.58 mean score; Inadequate of Electronic information search skills, with 3.56 mean score; Low internet bandwidth, with 3.55 mean score; Erratic power supply, with 3.54 mean score; complexity of online resources and Inaccessibility of ICT facilities, with 3.52 mean score. The top challenge is inadequate of continuity in e-resources subscription with 3.59 mean score, while the least challenge inhibiting the use of digital skills for research is poor postgraduate students' attitude to the use of EIRs, with 3.37 mean score.

In respect to challenges inhibiting digital skills of postgraduate students, the study found out that, the major challenges inhibiting the use of digital skills for research by postgraduate students in federal universities, Northwest of Nigeria. There is inconsistency in e-resources subscription, slow internet connectivity, inadequate of electronic information search skills, low internet bandwidth, erratic power supply, complexity of online resources, inadequate numbers of available computers, inadequate of computer literacy, inadequate of information literacy, technophobia, cost of training, and inadequate of IT infrastructures. This finding is in accord with the finding of Nguyen and Bui, (2022) who noted that many researchers find that their institutions lack policies or incentives that encourage the acquisition and use of digital skills. Obara, and Odusanya, (2023) also observed that resistance to adopting new technologies, as well as a lack of perceived importance for digital skills in certain research fields, also pose challenges. Furthermore the finding is in agreement to the findings of Eze, Chinedu-Eze, and Bello, (2021) that discovered that challenges inhibiting the use of digital skills include: identifying access issues, insufficient training.

Conclusion and Recommendations

The study concluded that, postgraduate students possess required digital skills to search and retrieve electronic information resources for their research, except Boolean operator, that is the use of "OR, AND or NOT" and the use of truncation, hence the postgraduate students do not possess advance digital skills for searching and retrieving electronic information resources for research. Having digital skills for searching and retrieving electronic information resources can contribute to enhanced research among postgraduate students. however, challenges such as inadequate of continuity in e-resources subscription, slow internet connectivity, low internet bandwidth, erratic power supply, affects the use of electronic information resources for enhanced research, hence, these challenges when resolved will lead to effective use of electronic information resources for enhanced research.

Based on the findings of this study, the following recommendations are made: The management of the selected federal university libraries in Northwest, Nigeria should provide regular training on required skills for postgraduate students as this would enhance their ability to possess digital skills. Intensify training on truncating skills and Boolean be given priority by librarian. Constantan electricity should be provided. Federal university managements should enhance internet connectivity and access to digital devices across campuses.

References

Charles, R. (2022). Digital Skills and self-employment among graduates of technical higher education institutions in Tanzania. *Tanzania journal of engineering and technology*, 41(1):46-55

Ebiefung, R. & Onah, E. (2021). Digital literacy skills as correlate of electronic information resources' (EIRs) use by university undergraduates in South-South, Nigeria. *Library philosophy and practice (e-journal)*. 629.https://digitalcommons.unl.edu/libphilprac/5629

Eze, S. C., Chinedu-Eze, V. C., & Bello, A. O. (2021). The role of digital skills in facilitating academic research productivity: Challenges and perspectives among postgraduate students. *Journal of educational technology systems, 49*(4), 423-445.

Ferninand, A. O., Nweke A. C. & Ochigbihi, P.(2018). Assessment of the information skills among students of college of federal university of of technology Stu., Enite

Friday, J. E., Ovwasa, D. E., & Onyenwenu, C. (2024). Digital literacy influence on research productivity of librarians in South-South Nigerian federal universities. *International journal of information studies and libraries, 9*(1), 88-102.

Gakibayo, A., Ikoja-Odongo, J. R., & Okello-Obura, C. (2013). Electronic information resources utilization by students in Mbarara university library (*library philosophy and practice (e-journal)*. 8 http://digitalcommons.unl.edu/libphilprac/869

Haruna A. M. & Bappah, M. (2022). Challenges of access and use of electronic information resources among students of higher institutions in Taraba State, Nigeria. *Covenant journal of library and information science (CJLIS)* 5 (1) 2682-5295

Ibanga, D. A. (2015). Solving the problem of poor quality of university graduates in Nigeria-a proposed holistic approach. British journal of education 3, (7). www.eajournals.org

Laura P., Gianluca A., Marco G., & Luca S (2016). The impact of digital skills on educational outcomes: evidence from performance tests, educational studies, DOI: 10.1080/03055698.2016.1148588 Retrieved on 15th, July, 2023

Manzo, B. S. (2020). ICT skills acquisition and competencies of academic librarians in mapping between digital competencies and digitalization of the accounting profession among postgraduate accounting students. *Asian journal of university education (AJUE) 19 (1) 83-94*

Nguyen, T., & Bui, L. (2022). *Institutional barriers to digital transformation in higher education research*. *Journal of educational technology research*, 20(3), 205-224. doi:10.3102/00346543211012354

Obara, E., & Odusanya, M. (2023). *Attitudinal resistance towards digital skills in academic research: A multi-site study*. *Research on technology in education*, 55(2), 112-130. doi:10.1080/10508406.2022.2054678

Okagbue, H. I., Opanuga, A.A., Oguntunde, P.E., Adamu, P. I., Iroham, C. O. & Angie O.I. Adebayo, (2018). Research output analysis for universities of technology in Nigeria. *International journal of education and information technologies* l (12) 105-109

Onah, J. C., Adayi, I. O., Okonkwo, E. A., & Onyebuchi, G. U., (2020). "Information retrieval skills as it correlate to undergraduate use of library information resources at a Nigerian university". *Library philosophy and Practice (ejournal*). 4586.https://digitalcommons.unl.edu/libphilprac/4586

Oseghale, O. (2023). *Di*gital information literacy skills and use of electronic resources by humanities graduate students at Kenneth Dike Library, University of Ibadan, Nigeria

Tagwai, A. Pam, D., Akamonye, I. G., Igwe, O. C. & Anyanwu, A. J. (2023). Information literacy skill and use of electronic resources by undergraduates of Kaduna state university. *Journal of applied information science and technology* 16 (1), 55-64

Vidosavljević, M. & Vidosavljević, S. (2019). The importance of teachers' digital literacy https://www.researchgate.net/publication/338607157

EFFECT OF TECHNOLOGICAL VARIABLES IN SHAPING DIGITAL PRESERVATION PRACTICES IN SELECTED ACADEMIC LIBRARIES IN EBONYI STATE, NIGERIA

Magnus Osahon Igbinovia
David Umahi, Federal University of Health Sciences, Uburu

Humphrey Igwechi Wiche
Ignatius Ajuru University of Education, Port Harcourt

Kenneth Ohis Irenoa
Federal University Otuoke, Nigeria

Abstract

The study examined the effect of technological variables on the digital preservation practices in selected academic libraries in Ebonyi State, Nigeria. The objectives of the study were to establish the level of digital preservation practices, effect of technological variables on digital reservation practices and challenges facing digital preservation practices in the selected academic libraries in Ebonyi State, Nigeri. The survey research design was adopted, while a questionnaire was used to elicit data from sixty-four (64) library professionals and library officers across four (4) selected academic libraries in the State. At the end of the data collection procedure, 51 copies were collected, found usable and subjected to descriptive analysis. The result showed a high level (Mean = 3.25) of digital preservation practices in the libraries. Technological variables (availability of technological infrastructure = 3.92, technological skills = 3.60 and technological characteristics = 3.28) affected digital preservation practices. The study also found that some challenges militating against digital preservation practices in academic libraries includes poor funding of libraries, inadequate technological infrastructure, lack of or poor implementation of digital preservation policy and lack of management support. The study concludes that technological variables remain at the core of the success of any digital preservation practices, and libraries must adapt and implement. The study recommended that academic libraries should develop and implement a digital preservation policy either as a standalone policy or as part of the library's preservation policy. And the management should also engage in advocacy and lobbying to seek institutional support and change stakeholders' perception towards digital preservation practices.

Keywords: Academic Libraries, Digital Preservation Practices, Ebonyi State, Technological Characteristics, Technological Infrastructure, Technological Skills, Nigeria

Introduction

Over the years, libraries have been utilising information resources both in print and electronic formats to meet the diverse information needs of their users. Thus, information service delivery in libraries was hinged on the availability of adequate information resources. Information resources were therefore considered a vital component of every library, regardless of type, size and location. However, with the advancement in Information and Communication Technologies (ICTs) and their adoption in libraries, there has been a marked shift from print to electronic/digital

information resources. To maximise the potential of digital resources, libraries are retrospectively converting their print resources to digital formats. Thus, these resources could be either created digitally or converted from print to digital forms. Information resources in digital forms are those resources that are accessible through digital devices such as computers, tablets and smartphones. Digital information resources provide access to a wide range of information and, as such, constitute a rich source of information for educational and non-educational purposes for different categories of information users. These resources include E-books, E-serials, E-reports, E-theses, E-pictures/photographs, databases, online encyclopedias, Listservs, and digital libraries.

Digital resources, unlike print resources, have a lifespan, which implies that they require preservation to prolong their lifespan. Although they could be more durable and lasting than prints, they are prone to certain deteriorative agents, which calls for their preservation. According to Cornell University Library in Lakshminarasimhappa and Veena (2014), preservation of digital resources includes a wide variety of operations intended to increase the functional life of machine-readable files and safeguard them against media failure, physical loss, and obsolescence. With the increasing adoption and use of these resources in libraries of the 21st century, scholarly attention has now been given to their preservation practices. According to Kari and Baro (2016), digital preservation practice encompasses all activities that are carried out to ensure that digital information is sustained for a long period. Akinlolu et al. (2023) described it as an organised and ongoing set of practices and behaviours that allow for the long-term, error-free storage of digital information, including techniques for retrieval and interpretation is known as digital preservation.

Digital preservation practices are fundamentally a responsibility expected of every library that intends to continuously deliver effective and efficient information services to its users for a prolonged time. Thus, the practice of digital preservation is crucial to academic libraries in their bid to provide a wide range of information resources in electronic formats to support teaching, learning and research. Anyaoku et al. (2019) highlighted some of these practices, which include technology emulation, information migration, encapsulation, and copying or refreshing. These strategies help standardise and guide the entire preservation activities in libraries.

Digital preservation among academic libraries in Nigeria has gained attention in the literature (Kari & Baro, 2016; Anyaoku et al., 2019; Akinlolu et al., 2023). However, there is a dearth of investigation regarding the factors that could influence digital preservation practices in academic libraries. It is logical to imply that digital preservation practice is a phenomenon that various personal and institutional factors can influence, Barrueco and Termens (2022). Digital preservation practice is hinged around concepts like digital resources and digitalisation, which are within the purview of technology. This makes technological variables a consideration in digital preservation in academic libraries. Technological variables are measurable constructs or factors relating to technology that can influence another investigated variable within a study. In the context of this study, the technological variables considered are the availability of technological infrastructure, technological skills and technological characteristics. These variables are concepts or factors that could influence technological innovation's effective deployment and utilisation, like digital preservation. Over the years, attempts have been made to create defined patterns to guide selection choices for digital preservation practices in academic libraries and related institutions.

The approaches to digital preservation over the years have helped improve the current strategies adopted today across library and archival institutions.

Technology is an essential part of every digital preservation practice (Masenya & Ngulube, 2021), it creates the opportunity for the development of digital resources and the migration from print to digital formats for preservation, and provides the platform for their preservation. Technology makes digital preservation possible (Thibodeau, 2005), emphasising the relevance of the unique characteristics of distinctive technological elements in the successful implementation of digital preservation practice. Moreover, Technology infrastructure is needed for digital preservation, which is a long-term commitment (Tallman, 2021). This makes the availability of technological infrastructure a factor that could predict the successful implementation of digital preservation practices. Using technological infrastructure to preserve digital resources is the responsibility of library staff. To do this effectively, they are expected to possess the required technological skills, which Oluranti et al. (2023) referred to as digital preservation skills. This study, therefore, examines the effect of technological variables (availability of technological infrastructure, technological skills and technological characteristics) on digital preservation practices using Academic Libraries in Ebonyi State, Nigeria. Choosing digital preservation practices requires selection choices that match the technological, or administrative requirement.

The significance of technological variables on digital preservation cannot be overemphasized as they influence the strategies, tools, and long-term viability of preserving digital content, from file formats, storage media, software and hardware dependencies, metadata and documentation, cybersecurity and digital rights management, big data challenges, and legal and ethical considerations. Technological variables shape digital preservation in many ways, including determining accessibility, cost, and longevity. Adopting open standards, ensuring redundancies are catered to, and maintaining robust metadata while adequately planning for technological obsolescence. The ability of institutions and libraries must balance innovation with risk management to ensure sustainable preservation efforts.

Statement of the Problem

The actualisation of an academic library's overall objective is conditioned on appropriately managing its information resources in both print and digital formats. While academic libraries have been observed to manage their print resources properly, there is a gap in practice concerning the management of digital resources. Specifically, observations revealed that most academic libraries in Ebonyi State are engaging in activities that will prolong the lifespan of their digital resources. This can deprive users of valuable information in these digital resources, conversely compromising the actualisation of the libraries' objectives.

Moreover, some academic libraries whose Heads are conscious of the need to engage in digital preservation practices are handicapped by the paucity of technological infrastructure required to preserve these resources. Most of these academic libraries lack the skilled manpower needed to make digital preservation practice a reality, which questions the possibility of achieving this task. Meanwhile, digital resources have inherent characteristics that undermine library personnel's efforts to implement digital preservation practices successfully. These issues holistically reflect the problem that this study intends to investigate.

Objectives of the Study

The objectives of the study examined the:

1. Level of digital preservation practices in the selected academic libraries in Ebonyi State;
2. Effect of technological variables on digital preservation practices in the selected academic libraries in Ebonyi State; and
3. Challenges facing digital preservation practices in the selected academic libraries in Ebonyi State.

Literature Review

The literature review was carried out to harness and synthesise previous studies in the context of digital preservation practices and technological variables, emphasising the availability of technological infrastructure, technological skills, and technological characteristics. According to Gautam (2021), digital preservation involves choosing and implementing an evolving range of strategies to achieve the accessibility discussed above. There are many preservation strategies to address the preservation needs of the different layers of digital concerns. The author noted some of these strategies, including refreshing, migration and replication. Hazarika (2020) defined digital preservation as a broad range of activities designed to extend the usable life of machine-readable computer files and protect them from media failure, physical loss and obsolescence. Hazarika gave some challenges of digital preservation as obsolescence in terms of technology, continuous migration, lack of legislation, policy, strategy and awareness, lack in the sense of collaboration and partnership, deterioration of the digital media and disaster planning and recovery.

The study of Akintonde and Awujoola (2022) investigated ICT skills and digital preservation practices among library personnel in nine university libraries in South-West, Nigeria. The study adopted the descriptive survey design; the population comprised 262 library personnel from nine university libraries in South-West, Nigeria. All personnel in the nine university libraries were sampled, while the questionnaire was the data collection instrument. Data was analysed using descriptive statistics, standard deviation, and correlation analysis. The majority of the respondents were male (46.9. ICT skills possessed by library personnel were: computing skills (3.56), word processing skills. Others were printing skills (3.52) and database creation and updating skills (3.30). The finding revealed a weak, significant positive relationship between computing skills and digital preservation practices ($n = 237$; $r = 0.288$, $p < 0.05$). The findings revealed a weak, significant positive relationship between computing management skills and digital preservation practices ($n = 237$; $r = 0.364$, $p < 0.05$). Digital preservation practices are essential to ensure the prolonged use of information resources in university libraries in South-West, Nigeria; as such, library personnel must possess adequate ICT skills. Therefore, it was recommended that library management review policies to accommodate and support effective digital preservation practices of information resources.

David and Soyemi (2021) investigated the influence of ICT Competence on Digital Preservation Practices in Private Universities in Ogun State, Nigeria. The study adopted the survey research design. The population for the study consisted of 164 library personnel from all private universities in Ogun State. The total enumeration method was employed. A structured, validated,

and reliable online questionnaire was used for data collection. The Cronbach's Alpha reliability coefficient for the constructs ranged from 0.70 to 0.93. A response rate of 98.8% was achieved. Results revealed that Information Communication Technology (ICT) Competence (F (1,159) =198.007, R2 =.529, P <0.05) has a significant influence on Librarians' digital preservation practices. Further, ICT competence components, basic ICT skills (β= 0.474, R=0.106, T= 2.263, P<0.05), Intermediate ICT skills (β= 1.134, R=0.340, T= 7.230, P<0.05), had a significant influence on digital preservation practices while advanced ICT skill had a positive weak significant influence (β= 0.333, R=0.140, T= 3.058, P>0.05) on Digital Preservation Practices of Private University Libraries Personnel in Ogun State, Nigeria. The level of digital preservation practice of librarians in private Universities in Ogun State, Nigeria was found to be high. ($\overline{x}$=4.01, SD=.531). The study concluded that Information Communication Technology (ICT) competence contributes to digital preservation practice in private University libraries in Ogun State, Nigeria. It recommended that the management of libraries put policies and programs in place to help sustain digital preservation practices.

The study of Jimada (2015) investigated the preservation of digital information resources in Federal University Libraries in North-Western States of Nigeria. Four research questions were constructed to achieve the objective of the study. A qualitative research methodology was used; purposive sampling was used for the study, and the instrument used for data collection was the structured interview. The responses from the respondents who are staff of the digitisation unit were analysed descriptively using tables. The results showed that the most popular information resources generated and preserved are theses, dissertations, preprints and postprints journals. External hard drives, CD-ROM/DVD, and computer hard disks are the common storage media used for preservation in the libraries studied. It was also discovered that migration and standards are popular strategies used for preservation. The study found that the significant challenges in preservation of digital information resources include: lack of infrastructure, technological obsolescence, poor maintenance culture, inadequate power supply and inadequate funding. The study concludes that even though some form of preservation is carried out on digital information resources in libraries, studied but not effectively and efficiently done. Given this, some recommendations were made, including providing different types of digital information resources such as record inventions, technical reports, use of mirror server, use of strategies such as emulation, refreshment, constant upgrades of hardware and software.

Ahmad and Rafiq (2022) carried out an assessment of the preparedness of libraries for digital preservation programs in terms of the availability of financial, technological, human resources, and policies and procedures. The sampling frame comprised of central libraries of 70 public sector universities and DAIS established till 2010. Out of the 70 targeted institutions, 63 participated in the survey with a response rate of 90%. Due to a lack of normality in the data, non-parametric tests (Mann-Whitney U and Kruskal-Wallis H) were applied for exploring significant differences and variances between different groups. Overall, a passive level of preparedness was observed for digital preservation in these libraries. A lower level of readiness was noted in terms of policies and procedures related to digital preservation (M = 1.79, SD = 1.039), training opportunities (M = 1.98, SD = 0.944), and skilled human resources (M = 2.07, SD = 1.110). The availability of funds for the acquisition of technological infrastructure (M = 2.59, SD = 1.364) was the only area where libraries had a good level of preparedness. Libraries of Islamabad Capital

Territory and the Punjab province showed better preparedness than libraries in other parts of the country. The study has theoretical implications for researchers and practical implications for university libraries, higher education administrative bodies, and university and library administrators.

Methodology

Quantitative methodology and survey research design was used to elicit responses on the variables under study from the sample of the study, which was analysed, and the findings were generalised to the population of the study, thus determining the population's current status with regard to the variables. The target population of the study consisted of sixty-four (64) professionals, library officers, and librarians from four selected academic libraries in Ebonyi State, Nigeria. These academic libraries are libraries of Alex Ekwueme Federal University, Ndufu Alike Ikwo; Akanu Ibiam Federal Polytechnic, Unwana; David Umahi Federal University of Health Sciences, Uburu; and Ebonyi State University, Abakaliki. Total enumeration was adopted as the sampling technique, due to the relatively small and manageable number. A questionnaire titled "Technological Variables and Digital Preservation Practices Questionnaire (TVDPPQ)" was sectioned according to the specific objectives of the study. A total of 64 copies of the questionnaire were administered to the study's participants to elicit data from them. Fifty-one (51) copies of the distributed questionnaire were returned and found fit for analysis, which constituted a 79% response rate, and the data was analysed using descriptive statistics.

Results and Discussion

This section presents the results from the data analysis, which are presented in Tables for easy interpretation.

Demographic Distribution of the Respondents

Table 1: Demographic characteristics of the respondents

S/N	Variables	Frequency	Percentage (%)
Affiliation			
1.	Alex Ekwueme Federal University, Ndufu Alike Ikwo	14	27
2.	Akanu Ibiam Federal Polytechnic, Unwana	19	37
3.	David Umahi Federal University of Health Sciences, Uburu	6	12
4.	Ebonyi State University, Abakaliki.	12	24
Gender			
1.	Male	31	61
2.	Female	20	39
Highest educational qualification			
1.	HND	11	22
2.	BLS/B.Sc.(LIS)	15	29
3.	MLIS	21	41
5.	PhD	4	8
Years of work experience			

1.	Below 10 years	22	43
2.	11 - 20 years	21	41
3.	21 - 30 years	8	16
4.	Above 30 years	-	-

The demographic characteristics of the study's respondents, as contained in Table 1, show the distribution of respondents across institutions, which could be a reflection of the size of the libraries or the willingness among the library personnel to participate in a survey of this nature. The demographic distribution is slighted tilted in favour of the male gender, which either implies that there are more males in the libraries or that more male library professionals participated in the study. Most of the respondents had a Master's degree in LIS, which places them in the category of academic librarians in their respective libraries. This puts them in good standing to understand the digital library practices available in their respective libraries and better respond to the survey.

Level of Digital Preservation Practices in the Selected Academic Libraries

***Table 2*:** Level of digital preservation practices in the libraries

S/N	Items	SA	A	UD	D	SD	Mean	Rank
1.	My library has a policy document that elaborately outlines the strategy for preserving digital information resources.	7(14%)	9(18%)	10(20%)	14(27%)	11(21%)	2.75	7th
2.	My library periodically transfers digital files from one format to another to overcome technological obsolescence (File format migration)	7(14%)	28(55%)	1(2%)	6(11%)	9(18%)	3.35	4th
3.	My library occasionally assesses digital materials to ensure they maintain integrity and are error-free (Auditing)	10 (20%)	27(52%)	2(4%)	4(8%)	8(16%)	3.53	1st
4.	My library carries out regular digital storage and backup of information resources, using cloud storage, institutional repositories, etc.	9(18%)	16(31%)	6(12%)	7(14%)	13(25%)	3.01	6th

5.	My library uses new software to replicate the functionality of previous software in order to retain access to digital files in obsolete technological environments (Technology emulation).	14(27%)	12(23%)	10(20%)	9(18%)	6(12%)	3.37	3rd
6.	My library keeps old technology that was used to create and access digital information in its original form (Technology encapsulation)	13(25%)	17(33%)	5(10%)	10(20%)	6(12%)	3.41	2nd
7.	Copying old digital files into newer media before the old media gets obsolete and the files become inaccessible (copying and refreshing).	11(21%)	19(37%)	8(16%)	3(6%)	10(20%)	3.35	4th
Grand Mean = 3.25								

The level of digital preservation practices in the academic libraries understudied is presented in Table 2. The result revealed that the calculated mean score was 3.25 against the criterion mean of 3.0, which implies that there is a high level of digital preservation practices in the library. This high level was contributed to by activities including auditing, encapsulation, technology emulation, copying and refreshing, file format migration, and regular storage being the least contributing item. However, the study showed that there is no digital preservation policy in the libraries that have ranked below the criterion mean. The finding of this study supports that of Anyaoku et al. (2019), where the study investigated digital preservation practices in university libraries and found that some of the strategies employed were technology emulation, encapsulation, information migration, and copying or refreshing. However, the study did not consider the level of digital preservation practices in the university libraries. David and Soyemi (2021), as part of their empirical investigation, examined the level of digital preservation in selected private universities in Nigeria. The study considered digital preservation policy as a multi-dimensional variable encompassing policy, strategies (information migration, encapsulation, technology emulation, and refreshing) and activities. The result showed a high level of digital preservation practices in the libraries.The findings of the study implies that the academic libraries are making a conscious effort towards preserving their digital resources

Effect of technological variables on digital preservation practices

Table 3: Effect of technological variables on digital preservation practices

S/N	Items	SA	A	UN	D	SD	Mean
Availability of technological infrastructures = 3.92							
1.	Having the required software for digital archiving will support digital preservation practices in my library.	23(45%)	19(37%)	2(4%)	5(10%)	2(4%)	4.09
2.	With the right technologies and tools, libraries can ensure long-term preservation of their digital resources.	27(53%)	20(39%)	1(2%)	3(6%)	-	4.39
3.	Shortage or inadequate technologies will adversely affect my library's ability to preserve its digital resources.	25(49%)	11(21%)	6(12%)	5(10%)	4(8%)	3.96
4.	Having the required network resources is crucial to ensuring long-term preservation of digital resources in my library.	16(31%)	21(41%)	9(18%)	4(8%)	1(2%)	3.92
5.	Having remote backup facilities is instrumental to the successful implementation of digital preservation practices in my library	10(20%)	17(33%)	6(12%)	11(21%)	7(14%)	3.23
Technological skills = 3.60							
6.	My ability to effectively use computer hardware and software would enhance the implementation of digital preservation practices in my library	11(21%)	17(33%)	6(12%)	9(18%)	8(16%)	3.27
7.	If I have technological training, I will be better empowered to engage in digital preservation practices.	21(41%)	19(37%)	3(6%)	6(12%)	2(4%)	4.0
8.	My ability to create, store and access digital information will help in the long-term preservation of digital resources in my library.	7(14%)	20(39%)	5(10%)	16(31%)	3(6%)	3.24
9.	Skillfulness in digital repositories and other digital	14(27%)	22(43%)	-	9(18%)	6(12%)	3.57

	storage systems will help me in digital preservation practices.						
10.	The successful implementation of digital preservation practices will be dependent on the technological skills of library staff	18(35%)	23(45%)	2(4%)	5(10%)	3(6%)	3.94
Technological characteristics = 3.28							
1.	Technological obsolescence threatens the successful digital preservation practices in libraries.	6(12%)	22(43%)	9(18%)	5(10%)	9(17%)	3.22
2.	The scalability of software for digital archiving positively influences digital preservation practices in libraries.	5(10%)	23(45%)	7(14%)	11(21%)	5(10%)	3.24
3.	Technological compatibility enhances the digital preservation tools and systems.	10(20%)	15(29%)	5(10%)	12(23%)	9(18%)	3.10
4.	The features of technology (hardware and software) will determine the success of digital preservation practices in libraries.	8(16%)	22(43%)	-	19(37%)	2(4%)	3.29
5.	The capabilities of technologies and tools for digital archiving will affect digital preservation practices in libraries.	18(35%)	15(29%)	2(4%)	10(20%)	6(12%)	3.57
Grand Mean = 3.6							

With a grand mean score of 3.6 and a criterion mean of 3.0, Table 3 shows that technological variables (availability of technological infrastructures, technological skills and technological characteristics) had a positive effect on digital preservation practices. Although the three dimensions within the technological variables individually showed to affect the digital preservation practices, the availability of technological infrastructure contributed more to the overall mean score. Accordingly, Matusiak et al. (2017) libraries in the digital era require technological infrastructure for long-term preservation of their digital resources. This reinforces the positive effect of technological infrastructure on digital preservation practices as revealed in this current study. An empirical investigation was carried out by Ahmad and Rafiq (2022) to assess how prepared university libraries are towards digital preservation. The outcome of the analysis of

data showed that the acquisition of technological infrastructure was one of the two areas in which the library had good or high preparation towards digital preservation. In contrast, skilled human resources had a lower level of preparation. This further underscores the effect of the availability of technological infrastructure on digital preservation practices. Moreover, David and Soyemi (2021) carried out an empirical examination on private university libraries in Ogun State of Nigeria, revealing that ICT competence/skills contribute to digital preservation practices in the libraries. On technological characteristics, Nikonova and Biryukova (2017) noted that the characteristics of digital resources affect digital preservation of cultural heritage. Ogunbodede and Onah (2024) succinctly stated that it is only with technological infrastructure and adequate technology skills that modern preservation practices can be a success in the case of a federal university in Nigeria. The findings of the study implies that academic libraries will most likely practice digital preservation when there is technological infrastructure, the staff or personnel have high technological skills, and the technologies have favourable characteristics.

Challenges facing digital preservation practices in the two federal universities

Table 4: Challenges facing digital preservation practices in the two federal universities

S/N	Items	SA	A	UN	D	SD	Mean
1.	Rapid changes in technologies related to digital preservation practices	15(29%)	12(23%)	7(14%)	10(20%)	7(14%)	3.35
2.	Software obsolescence and hardware incompatibility	11(21%)	18(35%)	10(20%)	9(18%)	3(6%)	3.49
3.	Lack of expertise on digital preservation among library personnel	8(16%)	12(23%)	5(10%)	15(29%)	11(22%)	2.82
4.	Inadequate technological infrastructure (hardware, software and Internet)	21(41%)	17(33%)	-	8(16%)	5(10%)	3.80
5.	Lack of or poor implementation of digital preservation policy	16(31%)	22(43%)	1(2%)	4(8%)	8(16%)	3.67
6.	Lack of management support	19(37%)	15(29%)	3(6%)	7(14%)	7(14%)	3.63
7.	Copyright issues in preserving digital information resources	11(22%)	16(31%)	-	15(29%)	9(18%)	3.10
8.	Poor funding of the library	20(39%)	22(43%)	7(14%)	2(4%)	-	4.18
9.	Lack of standards (like a metadata standard) for consistency in digital preservation	9(18%)	14(27%)	5(10%)	10(20%)	13(25%)	2.92
10.	Poor attitude of library staff towards digital preservation practices.	12(23%)	11(22%)	3(6%)	21(41%)	4(8%)	3.12

Table 4 showed that digital preservation practices in the academic libraries under investigation are challenged by several factors, among which include poor funding of libraries, inadequate technological infrastructure, lack of or poor implementation of digital preservation policy, lack of management support, among others. However, the study revealed that lack of

expertise on digital preservation among library personnel and lack of standards for consistency in digital preservation, with mean scores of 2.82 and 2.92, respectively, did not meet the criterion mean of 3.0, as such were not considered as challenges to effective digital preservation practices in academic libraries.

Previous studies have explored the diverse challenges militating against digital preservation practices in university libraries. In line with this study, David and Soyemi (2021) listed some of these challenges as lack of finance, limited budget and inadequate ICT infrastructure. Formenton and Gracioso (2020) also corroborated the findings of this study when the authors listed some of the challenges of digital preservation to include rapid technological obsolescence, issues around intellectual property rights, and scarcity of financial resources and lack of institutional commitment to the course. In contrast to this study, Formenton and Gracioso (2020) found that variance in digital file formats and standards and the need for a skilled workforce were challenges to digital preservation practices. The study results implies that unless these challenges are address, issues related to digital preservation practices will continue to be a threat to academic libraries in trying to ensure continued use of print information resources that are need to be digitized in this digital world that we live.

Conclusion and Recommendations

Digital preservation practices have more than ever gotten the attention of librarians, especially those in academic libraries. The high influx of digital resources into academic libraries has necessitated the need for adequate preservation of these resources in order to contribute positively to the achievement of the libraries' objectives. Consequently, academic libraries in Ebonyi State seem to be engaging in activities or practices that prolong the lifespan of digital resources. However, the availability of technological infrastructure will likely determine the effectiveness of digital preservation practices, the technological skill and technological characteristics. In addition, there is a plethora of challenges which academic libraries also need to address towards the successful implementation of digital library practices. As such, the following are recommended: Academic libraries should seek alternative funding to acquire modern or far-from-obsolete digital preservation technologies. Academic library management should continuously organise training programmes for staff to increase their skills in using digital preservation technologies. Academic libraries should develop and implement a digital preservation policy either as a standalone policy or as part of the library's preservation policy. And the management should engage in advocacy and lobbying to seek institutional support and change stakeholders' perception towards digital preservation practices.

References

Ahmad, R. & Rafiq, M. (2022). Assessing the preparedness of university libraries for digital preservation. The Journal of Academic Librarianship, 48(6), 102617. Retrieved from https://doi.org/10.1016/j.acalib.2022.102617

Akinlolu, M. O., Awujoola, O. A. & Olawale, Y. J. (2023). Digital preservation practices and use of digital library by postgraduate students in selected Universities in South-West, Nigeria. Library Philosophy and Practice (e-journal). 8015. Retrieved from https://digitalcommons.unl.edu/libphilprac/8015

Akintonde, A. A. & Awujoola, O. A. (2022). Information and communication technology skills and digital preservation practices by library personnel in some selected university libraries in South-West, Nigeria. *Library Philosophy and Practice (e-journal) l,* 7358. https://digitalcommons.unl.edu/libphilprac/7358

Anyaoku, E. N., Anthonia, U., Echedom, N. & Baro, E. E. (2019). Digital preservation practices in university libraries: An investigation of institutional repositories in Africa. *Digital Library Perspectives,* 35 (1), 41-64, Retrieved from https://doi.org/10.1108/DLP-10-2017-0041

Awamleh, M. A. & H. F. (2022). Digital preservation of information sources at academic libraries in Jordan: an employee's perspective. *Library Management,* 43(1/2). 172-191. https://doi.org/10.1108/LM-10-2021-0088

Barrueco, J. M. & Termens, M. (2022). Digital preservation in institutional repositories: A systematic literature review. Digital Library Perspectives, 38(2) 161- 174. Retrieved from https://doi.org/10.1108/DLP-02-2021-0011

David, S. & Soyemi, O.D (2021). ICT competence and digital preservation practices of library personnel in selected Nigerian private universities. *International Journal of Academic Research in Education and Review,* 9(5), 248-259,

Formenton, D. & Gracioso, L. (2020). Digital preservation: *challenges, requirements, strategies and scientific output.* RDBCI: Rev. Dig. Bibliotec e Ci. Info. / RDBCI: Dig. J. of Lib. and Info. Sci., 18, e020012. Available at: http://cariniana.ibict.br/index.php/inicio.

Hazarika, R. (2020). Digital preservation in academic libraries. *International Journal of Library and Information Studies,* 10(2), 220-2025.

Jimada A. (2015). Preservation of digital information resources in the federal university libraries in the North-Western States of Nigeria. Master's thesis, Department of Library and Information Science, Faculty of Education, Ahmadu Bello University, Zaria.

Kari, K. H. & Baro, E. E. (2016). Digital Preservation Practices in University Libraries: A Survey of Institutional Repositories in Nigeria. *Preservation, Digital Technology & Culture*, 45(3), 134-144. Retrieved from https://doi.org/10.1515/pdtc-2016-0006

Kumar Gautam, D. K. (2021). Digital Preservation in Academic Libraries. *IOSR Journal of Humanities And Social Science (IOSR-JHSS), 26(9),33-36*

Lakshminarasimhappa, M. C. & Veena, M. R. (2014). Digital preservation in libraries why and how. *International Journal of Digital Library Services*,4(4), 90-97. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/9444.pdf

Lee, K., Slattery, O., Lu, R., Tang, X., and McCrary, V. (2002). The State of the Art and Practice in Digital Preservation. *Journal of Research of the National Institute of Standards and Technology. 107(1) 96-106.*

Masenya, T.M. & Ngulube, P. (2021). Digital preservation systems and technologies in South African academic libraries. *South African Journal of Information Management* 23(1), a1249. https://doi.org/10.4102/ sajim.v23i1.1249

Matusiak, K.K., Tyler, A., Newton, C. and Polepeddi, P. (2017). Finding access and digital Preservation solutions for a digitised oral history project: a case study. *Digital Library Perspectives*, 33(2), 88-99.

Nikonova, A. A. & Biryukova, M. V. (2017). The role of digital technologies in the preservation of cultural heritage. *Muzeológia a kultúrne dedičstvo, 2017, 5:1:169-173*

Ogunbodede, K. F. & Onah, E. E. (2024). Assessment of Modern Preservation Practices at the Federal University Otuoke Library, Bayelsa State. *Southern African Journal of Security*, 15899:1-8. Retrieved from https://doi.org/10.25159/3005-4222/15899

Oluranti, F. E., Olorunleke, A. R. & Atanda Abiodun, A. (2023). Digital Preservation Skills of Electronic Information Resources' Management among Library Personnel in Selected Universities in Nigeria *European Journal of Computer Science and Information Technology* 11 (3), 75-87. Retrieved from https://eajournals.org/ejcsit/wp-content/uploads/sites/21/2023/07/Digital-Preservation.pdf

Tallman, N. (2021). A 21st Century technical infrastructure for digital preservation. *Information Technology and Libraries*, *40*(4). Retrieved from https://doi.org/10.6017/ital.v40i4.13355

Thibodeau, K. (2005). Overview of technological approaches to digital preservation and challenges in coming years. The State of Digital Preservation: An International Perspective. Conference Proceedings. Retrieved from https://chnm.gmu.edu/digitalhistory/links/pdf/preserving/8_37e.pdf

UTILIZATION OF INTEGRATED LIBRARY MANAGEMENT SOFTWARE FOR LIBRARY OPERATIONS AND SERVICE IN ACADEMIC LIBRARIES, KADUNA STATE, NIGERIA

OGOR, Stephen Icha
Air Force Institute of Technology (AFIT), Kaduna

Garba **Ali Karaye Ph.D**
Ahmadu Bello University (ABU), Zaria

JOSHUA, Magoi Ph.D
Kaduna State University (KASU), Kaduna State

Abstract

This paper examined the utilization of integrated library management software for library operations and service in academic libraries, Kaduna state Nigeria.The objectives find out the types of Integrated Library Management Software available for service delivery, to discover the extent of Utilization of Integrated library management software and to identify the challenges in the Utilization of Integrated Library Management Software in Service Delivery in Academic Libraries in Kaduna State. Quantitative research methodology was adopted for this study with the use of cross-sectional survey design. The target population is 292, while the sample size is 165, the sampling technique used is simply random sampling and the instrument used was questionnaire. A total of one hundred and sixty-five (165, i.e.100%) copies of questionnaire were administered to the respondents, out of which one hundred and thirty-three (133) representing 80.6% were duly completed, returned and used for this study. data collected were analyzed using descriptive statistic. The findings revealed that KOHA is the dominant library management software in use and that the extent of ILMS utilization on service delivery was low. Challenges identified for the low extent of utilization include: Poor funding; fluctuating network ; Lack of support by management; Poor ICT infrastructures; Poor ICT skills among library staff; Erratic power; and Lack of training of library staff. The study concludes that the adoption and comprehensive utilization of all the modules of ILMS is mandatory for academic libraries if enhanced service delivery would be achieved. The study therefore recommends that Managers and decision-makers of academic libraries in Kaduna State should prioritize the use of both open source and proprietary Integrated Library Management Software for service delivery in all sections/units of their libraries by making a policy decision in favour of it. Again, Training and retraining of library manpower should be a frequent and continuous exercise by academic library managers in Kaduna State.

KEYWORDS: Academic Libraries, Integrated Library Management Software, Kaduna State, Library Operations and Service, Utilization, Nigeria

Introduction

Integrated Library Management Software (ILMS) are software that enables libraries to organize their information resources for easy access and retrieval. Libraries are warehouses of information and knowledge cutting across all fields of human endeavor. These information and knowledge will be useless if not accessible at the time they are needed. ILMS is the bedrock for library automation that allows for faster and efficient library services. Ayodele in 2015 submitted

that, there are generally two categories of library application software: Proprietary software and Open source software. Proprietary Software refers to any computer software that has restrictions on any combination of the usage, modification, copying or distributing modified versions of the software. Proprietary software may also be called closed –source software. Open Source Software (OSS) is computer software with its source code made available and licensed with a license body in which the copyright holder provides the right to study, change and distribute the software to anyone and for any purpose. Open Source Software movement accelerated the development of compatible open source library software, partly to provide an alternative to the sometimes highly prohibitive cost of the Proprietary Software.

Open Source Software has been defined as "free distribution and redistribution of software and source code; licenses that allow distribution of modifications and derived works and non-discrimination against persons, groups or fields of endeavor". In other words, it refers to any computer software that is released free of cost and its licenses usually prohibit modifications and commercial redistribution. It then implies that integrated library management software is a key component of software requirement for library automation. According to Chow and Bucknail (2012), ILMS is an enterprise-level software package that manages, integrates and centralizes multiple core library functions and services. ILMS systems are designed to help libraries with three primary duties: increase operational efficiency, provide access to library's collection and provide access to external resources.

Statement of the Problem

The use of integrated library management software is considered as one of the best practices for library management around the world. Such software has made it possible for librarians to enhance services in diverse sections of libraries. It has reduced the workload for library staff in terms of classification, cataloguing, circulation, acquisitions and other operations. It made cataloguing easier with the use of scanning technology employed on books barcodes, keeping track of library materials became easier than the manual methods. It also helps to quickly identify inventory stock when budgeting for new library materials.

Despite the huge benefits derived from the use of ILMS for service delivery, a lot of Nigerian tertiary institution libraries particularly academic libraries in Kaduna state seem not to have achieve enhanced service delivery after the adoption of ILMS. Submissions by Olatunji and Tiamiyu (2022) and Uzomba et al. (2015) revealed that ILMS after adoption by Nigerian tertiary institutions has not significantly enhanced service delivery. One may then wonder why it is so.

It is in the light of the above, that this research is aimed at finding out the extent of utilization of integrated library management software for service delivery in academic libraries in Kaduna State, Nigeria

Objectives of the Study

The following objectives guided the study:

1. To find out the types of Integrated Library Management Software available for operations and service delivery in Academic Libraries in Kaduna State.
2. To discover the extent of Utilization of Integrated Library Management Software by Academic Libraries in Kaduna State, Nigeria

3. To identify the challenges in the Utilization of Integrated Library Management Software for operations and service Delivery in Academic Libraries in Kaduna State

Literature Review

The growth of Integrated Library Management Software (ILMS) is no doubt more visible in the 21st Century. Many academic libraries now make use of the available ILMS to render services to library users. Several integrated library management software have penetrated the Nigerian libraries. The early generations of integrated library management software were not user friendly and interactive. This made it difficult to use by library staff, though they were more efficient than the paper systems libraries had been using for generations. (Olatunji & Tiamiyu, 2022). Oyovwe-Tinuoye and Omosekejimi (2022) stressed that the list of available ILMS includes: Micro CDS/ISIS (free), Library Plus (which replaced x-lib software), Green Stone Software, Graphical Library Automation System (this replaced The Information Navigator Library Software, TINLIB), Alice for Windows Software and Alexandra, others are: Docuware, Strategic Library Automation Management (SLAM), Liberty 3 Software and Microsoft Access Software. Concourse Book System and Atriuum are proprietary library management software. Most integrated library management software separate functions into discrete programs called modules, each of the modules integrate within a unified interface.

Adamu, Ibrahim and Gbaje (2020) alluded to the fact that many Integrated Library Management Software (ILMS) packages are available to Nigerian libraries. These according to them includes Liberty, LIBS+(X-Lib), CDS/ISIS, TINLIB, GLASS, Alice for Windows, Innovative Millennium, Virtua, KOHA, Voyager and most recently NewGenLib. Muller (2011) stated that integrated library management software is multifunction, adaptable software applications that allow libraries to manage their daily tasks in a more efficient way. Olakoge and Kolawole (2019) submitted that the integrated library management software that have been introduced into the Nigerian academic libraries includes: Alice for Windows, Web-Based Integrated Library System (WEBLIS), The Information Navigator Library Software (TINLIB), Automated Library (AUTOLIB), Graphic Library Automation System (GLAS), Koha, Automation of Libraries and Centres of Documentation (ABCD), Integrated Library Management System, Evergreen Software, NewGenLib, Computer Documentation System/ Integrated Set of Information Systems (CDS/ISIS). Due to the limitation of some software, many libraries had migrated from one software to another in order to improve performance and service efficiencies.

The use of ILMS started in Nigeria in the mid-1970s and early 1980s, when three notable universities – the University of Ibadan, the University of Lagos and Ahmadu Bello University, Zaria - started computerization. The National University Commission (NUC) presented a microcomputer and local area network together with the Information Navigator (TINLIB) software to 20 academic libraries in Nigeria (Uzomba, Oyebola, & Izuchukwu; 2015). Due to the efficiency in library operations and services as a result of using this software, many other academic libraries now began to introduce automation. In 1980 Ahmadu Bello University (ABU) library in Zaria also started, while in the year 1990, the University of Jos library joined in the automation movement. As reported earlier, the University of Ibadan Library started library automation with TINLIB in 1994, as did the Federal University of Agriculture Abeokuta, but later migrated to the GLAS software. Olabisi Onabanjo University library in Ogun State started automation in 2000 using

Alice for Windows software but they later migrated to Koha (Adegbore; 2010). A notable private university, Bowen University, started library automation in 2007 using Koha Integrated Library Systems Software (Otunla & Akanmu–Adeyemo; 2010).

A review of literature on ILMS by Kari and Baro (2014) in Nigerian academic libraries reveals that most libraries depend on free and donated software. For example, the University of Ibadan Library started with CDS/ISIS that was developed and distributed freely by UNESCO in 1993. In 1994, the library migrated to TINLIB which was introduced by the World Bank Project in 1994-1995. Citing a study carried out by Idowu and Mabavonku (1999) in Bozimo(2006) findings reveals that 92.3 per cent of the 13 federal universities studied were using TINLIB for their automation projects, while 15.4 per cent of the universities were using CDS/ISIS. The reason for the prevalent use of TINLIB was because the NUC made the software available for universities under the World Bank intervention loan package to Nigerian Universities (Bozimo, 2006).

Similarly, Emasealu (2019) attributed the discontinuation of TINLIB by Ibadan University to the need for change in the operating system from DOS to Windows. DOS-based software lack flexibility and were incapable of performing the advanced functions required for delivering smooth library services. By 2004, Ibadan acquired ALICE for Windows. Although the software was Windows-based, it did not meet their needs because it was not MARC 21-compliant and, as a result, it had no interface for sharing resources. Oyedokun *et al.* (2018) reported that the choice of TINLIB was made by the Committee of University Librarians of Nigerian Universities (CULNU) because there were modules for acquisitions, cataloging, serials control, circulation and report generation, all of which operate as an integrated unit. Atanda (2018) noted that the task of choosing a software package for a library is often difficult because the package must be sufficiently powerful and versatile to cope with all library processes and, at the same time, be user friendly.

Alam and Mezbah-ul-Islam (2020) reported that Koha is the first and most extensively used open source ILMS which is free library management software with source code under the "General Public License" (GPL). Katipo Communications of New Zealand developed the Koha software in 1999 which went live for the first time in January 2000. Koha includes such modules as acquisition, cataloging, OPAC, circulation, Inter-Library Loan, serials control, patron management, and report generation modules. It has two Graphical User Interfaces (GUIs) - one for users, and another for staff. However, as the technology advances, other ILMSs begin to emerge. This include: Concourse, Atriuum, Virtua, NewGenLib and SLAM. Also, Hamisu (2021) in his literature review cited Kari and Baro, (2014) who studied the use and challenges of integrated library management software in Nigerian universities. Purposively, the study selected 124 universities. And the findings revealed that majority of Nigerian libraries, about 67% use KOHA library software. Another reasonable percentage of the libraries used SLAM (Simultaneous localization and mapping) and VIRTUA software. The VIRTUA in particular was found highly versatile and internet-based, flexible, user-friendly, customizable, time-saving, and it MARC21 (Machine-Readable Cataloguing) compliant interface aids in sharing resources.

Integrated Library Management Software is a software package that is used by academic libraries to perform the housekeeping functions of the library such as imputing of bibliographic details of information resources like titles, author's name, pagination, publication information

edition statement, price, etc. of all the books in a library database. It helps to provide information on any book present in the library to the user as well as library personnel. Integrated Library Management Software keeps track of all the books that are checked-out to library patrons, returned and/or added to the library. Registration of library users, performing of inventory, ordering for new materials, serial control, overseeing of fee collection and fines for defaulters of information resources are among other important functions of ILMS.

Citing Hussaini, Vashistha, Jimoh and Jimah (2017) in Oyovwe-Tinuoye and Omosekejimi, (2022) pointed out that the usage of software management software/databases cannot be applied in all the sections of the library, in view of this, the authors asserted that some of the sections in the library where software/databases can be applied and be used to render services to users in the library are acquisition, Online Public Access Catalogue (OPAC), Circulation, Serial Control, Digital Library and Administration. The circulation services of the library are now being discharged with the use of integrated library management software. Such services include online charging and discharging of information resources, online registration of clienteles and other services. Integrated library management software (ILMS) are multifunction, adaptable software applications that allow libraries to manage, catalog and circulate their materials to patrons.

"In choosing ILS software, libraries must base their decision not only on the performance and efficiency of the system but also on its fundamental flexibility to readily adapt to the future demands and needs of their patrons" (Muller, 2011). An effective ILMS provides computerization for all aspects of the library operation. These products are generally organized into modules that address specific functional areas. Such modules as stated by Uzomba, Oyebola and Izuchukwu, (2015) include cataloging for creating bibliographic records that represent works in the library's collection, circulation that automates tasks related to loaning items to patrons, serials control for managing periodicals and serials, acquisitions to handle the procurement process for new items added to the library collection, and the online public access catalogue (OPAC) to allow library users to search or browse through the library's collection.

Service delivery using ILMS is designed to boost all library services as expected by the library patrons. "A good and reliable ILS upsurges management, control and easy access to information resources that are physical in a library and outside, for example, books, CD-ROM, e-journal, e-books, e-databases and repositories among others. It also helps to lessen time wastage in the delivery of services to library users" (Oyovwe-Tinuoye & Omosekejimi, 2022). Nigerian academic libraries have experienced many challenges in relation to the use of ILMS such as erratic power, inadequate professional librarians to support projects, lack of maintenance and support agreements, poor ICT infrastructures, poor funding and poor ICT skills among library staff (Kari & Baro, 2014). They asserted that another major challenge of library automation in Nigeria has to do with the choice of integrated library management software (ILMS). The selection of suitable software packages for libraries has become problematic due to lack of good up-to-date comparative studies. Onohwakpor and Anre (2007) observed that software selection decision in libraries is based on report from other colleagues through conferences. They also note that some libraries do not do a thorough system needs assessment. The selection of relevant software is an important step in library automation.

On a study to investigate the factors affecting the use of integrated library management software among users in Federal University Libraries carried out by Oyovwe-Tinuoye and Omosekejimi, (2022). Findings revealed the following challenges: lack of awareness, poor Internet connectivity /low bandwidth, lack of information searching skills, lack of proper guidance from librarians, lack of funds to support automation project by library management, shortage of computer systems designated for library OPAC, lack of required ICT skills, complex OPAC interface design, erratic electricity power supply/high cost of running electricity generating sets and lack of user training on how to use the library software. This agrees with Kari and Baro (2014) who posited that Lack of skilled manpower, lack of funding, lack of sufficient computer systems and erratic power supply are the major problems encountered while using library software.

A study on the challenges facing effective utilization of ILMS by academic library done by Oludipe and Babafemi (2019), revealed that abnormal termination of system was ranked 1st with the mean score 3.11, errors in inverted file generation was ranked 2nd with the mean score of 3.02, errors of system installation were ranked 3rd with the mean score of 2.88 while removing of inverted file was ranked 9th with the mean score of 2.25. As a result of this, it is was clear that the abnormal termination of the system constituted the major challenge facing effective utilization of ILMS in academic libraries which has the highest mean score. Other challenges according to the study include: Corruption of relevant data on the system, Errors in import or export, Errors in printing or sorting, and Backup errors.

Aravind and Kavitha (2020) conducted a study on Issues and Challenges in Library Automation with Special Reference to Arts and Science Colleges. The study aims to analyze major issues and challenges involved in the library automation among the Colleges affiliated to Madurai Kamaraj University, Madurai India. The study covers the period from 2018-2019. Survey method was used for data collection as well as structured questionnaires were used. For this study 54 colleges were chosen. Collected data were analyzed using appropriate descriptive and inferential statistics.

Furthermore, the study identified that lack of standardization, lack of user-friendly software, shortage of manpower, lack of proper service from the vendor, upgrading problem as technical problems and lack of necessary funds, others issues identified are management decisions and lack of adequate training of staff as major challenges of software deployment for library automation. This is in agreement with earlier submissions by other scholars such as Oyovwe-Tinuoye and Omosekejimi, (2022), ,Nayana (2019) and Ajani and Buraimo (2022).

In another study carried out by Abbas (2014), it was found that all the ILMS modules are partially implemented in ABU, Zaria while only cataloguing modules have been completed at University of Ibadan Library. The partial or none implementation of the integrated library management software modules as a major challenge in the successful implementation of library automation project in Nigeria is the very concern that necessitated the move for the commencement of this study

Methodology

The research methodology adopted for this study is quantitative research methodology. A cross-sectional survey research design was adopted for this study. The sample size for this study

comprised of one hundred and sixty-five (165) staff from four (4) public university libraries (Ahmadu Bello University, Zaria, Airfoce Institute of Technology Kaduna, Kaduna State University, Kaduna and Nigerian Defence Academy) in Kaduna State, Nigeria that have adopted integrated library management software for library automation processes of their operations and services. The instrument used for data collection is questionnaire. A self-developed closed-ended structured questionnaire was used to collect data from the respondents that formed the sample in the study. The set of the questionnaire was designed to collect data from the different sections/units of the academic libraries in the universities that formed the population of the study. Five points Likert-Scale of measurement was used for assessing the extent to which Academic Libraries in Kaduna State Utilize Integrated Library Management Software for Service Delivery. The Mean Benchmark 3.0 was used. The data collected from the field were analyzed using the Statistical Package for Social Sciences (SPSS) IBM version 25.

Results and Discussions

The study after collecting and analyzing data on the utilization of ILMS by academic libraries for service delivery in Kaduna State, Nigeria, presents the results of as follows:

Type(s) of Integrated Library Management Software Available to Academic Libraries in Kaduna State

The first objective was to find out the Type(s) of Integrated Library Management Software Available to Academic Libraries in Kaduna State. Table 1 showed the information received from respondents in the above regards.

Table 1: Type(s) of ILMS available to Academic libraries in Kaduna State

	AFIT				**KIL**				**NDA**				**KASU**				**Total**		
Type(s) of ILMS	NA	%	Av	%	NA	%	AV	%	NA	%	Av	%	NA	%	Av	%	Total	NA	Available
Alice for windows	24	18.1	0	0.0	45	33.8	13	9.8	14	10.5	0	0.0	32	24.1	5	3.8	133	86.5	13.5
Atriuum	24	18.1	0	0.0	58	43.6	0	0.0	14	10.5	0	0.0	37	27.8	0	0.0	133	100.0	0.0
CDS/ISIS	23	17.3	1	0.8	56	42.1	2	1.5	14	10.5	0	0.0	31	23.3	6	4.5	133	93.2	6.8
Concourse Book System	24	18.1	0	0.0	57	42.9	1	0.8	14	10.5	0	0.0	37	27.8	0	0.0	133	99.3	0.8
E-Lib	14	10.5	10	7.5	41	30.8	17	12.8	7	5.3	7	5.3	25	18.8	12	9.0	133	65.4	34.6
Evergreen	24	18.1	0	0.0	57	42.9	1	0.8	13	9.8	1	0.8	37	27.8	0	0.0	133	98.5	1.5
G-lass	24	18.1	0	0.0	56	42.1	2	1.5	14	10.5	0	0.0	37	27.8	0	0.0	133	98.5	1.5
KOHA	24	18.1	0	0.0	3	2.3	55	41.4	2	1.5	12	9.0	7	5.3	30	22.6	133	27.1	72.9
Liberty	24	18.1	0	0.0	58	43.6	0	0.0	11	8.3	3	2.3	29	21.8	8	6.0	133	91.7	8.3
Libinfo	24	18.1	0	0.0	58	43.6	0	0.0	13	9.8	1	0.8	30	22.6	7	5.3	133	94	6.0
Libsy	24	18.1	0	0.0	57	42.9	1	0.8	14	10.5	0	0.0	30	22.6	7	5.3	133	94	6.0
Millennium	24	18.1	0	0.0	58	43.6	0	0.0	14	10.5	0	0.0	33	24.8	4	3.0	133	97	3.0
NewGenLib	24	18.1	0	0.0	58	43.6	0	0.0	14	10.5	0	0.0	31	23.3	6	4.5	133	95.5	4.5
SOUL	24	18.1	0	0.0	58	43.6	0	0.0	14	10.5	0	0.0	37	27.8	0	0.0	133	100.0	0.0
Strategic Lib Automation	24	18.1	0	0.0	56	42.1	2	1.5	14	10.5	0	0.0	33	24.8	4	3.0	133	95.5	4.5
Tin-Lib	24	18.1	0	0.0	54	40.6	4	3.0	14	10.5	0	0.0	29	21.8	8	6.0	133	90.9	9.0
Virtua	24	18.1	0	0.0	38	28.6	20	15	14	10.5	0	0.0	32	24.1	5	3.8	133	81.2	18.8
X-Lib	24	18.1	0	0.0	53	39.9	5	3.8	14	10.5	0	0.0	34	25.6	3	2.3	133	93.9	6.0

Source: Field Survey, 2024. **Key**: AFIT= Air Force Institute of Technology; KASU= Kaduna State University; KIL= Kashim Ibrahim Library; NDA= Nigerian Defense Academy; %= Percentage; NA= Not Available; Av= Available

Table 1 indicates that some types of Integrated Library Management Software were available to academic libraries in Kaduna State. Among the once available are KOHA which has the highest scores of 72.9%, followed by E-Lib with 34.6% and then Virtua scoring the third highest scores of 18.8%. On the other hand, Atriuum, Concourse Book System and SOUL were very unpopular with academic libraries is Kaduna State with respondents showing 100%, 99.3% and 100% none awareness of these Integrated Library Management Software in their libraries respectively.

Findings shows KOHA having the highest scores which may not be unconnected with the fact that it is open source and can handle a large collection without the need for annual subscription which must library's budget cannot handle. KOHA is open source software with the ability to index documents for easy search, retrieval and archiving bibliographic databases for online access. Its design architecture accommodates communication standard and cataloguing tools such as MARC I & II and *Z39.50*. Koha being a foremost library automation software aside the fact that is open and free, the advantages of open source is numerous compared with proprietary software. This explains the reasons for the wide adoption in both developed and developing countries of the world. KOHA for example enhances community participation. It is reliable because of the access to source code, flexible for modification to suit specific needs, it involves little or minimal expenses (Ajani & Olayinka, 2022).

The implications of this finding is that, academic libraries will continue to patronize KOHA Integrated Library Management Software because it is open source and free, and can handle most of their routine library services unlike the proprietary software that requires annual subscriptions (though would be handy to provide technical support when need be).

Extent to which Academic Libraries in Kaduna State Utilize Integrated Library Management Software for Service Delivery

The research objective was to discover the extent of Utilization of Integrated Library Management Softwares by Academic Libraries in Kaduna State. The analysis of responses is shown in Table 2 below.

Table 2: Extent to which Academic Libraries in Kaduna State Utilize Integrated Library Management Software (Perceived Ease of Use) for Service Delivery

	AFIT				KIL				NDA				KASU				TOTAL		
Section of Utilizing ILMS	U	LE	HE	Mean	U	LE	HE	Mean	U	LE	HE	Mean	U	LE	HE	Mean	T	∑ Mean	Av. Mean
Circulation Section/Unit	0	10	14	2.3	3	10	45	2.7	3	1	10	2.5	4	1	32	2.8	133	10.6	2.7
Collection Development	0	9	15	2.6	14	10	34	2.3	3	5	6	2.2	3	0	34	2.8	133	10.0	2.5
Serial Control Unit	6	8	10	2.2	22	5	31	2.2	3	7	4	2.1	2	3	32	2.8	133	9.2	2.3
Reference Section	3	10	11	2.3	18	10	30	2.2	5	6	3	1.9	3	1	33	2.8	133	9.2	2.4
Cataloguing& Classification	5	6	13	2.3	13	8	37	2.4	3	0	11	2.6	0	3	34	2.9	133	10.2	2.6
Administrative Section	10	3	11	2.0	21	13	24	2.1	5	2	7	2.1	6	1	30	2.6	133	8.9	2.2
Reserved Section	9	6	9	2.0	20	16	22	2.0	4	5	5	2.1	3	2	32	2.8	133	8.9	2.2
Electronic Section	6	6	12	2.3	16	4	38	2.4	2	0	12	2.7	2	2	33	2.8	133	10.2	2.5

Source: Field Survey, 2024. **Key**: AFIT= Air Force Institute of Technology; KASU= Kaduna State University; KIL= Kashim Ibrahim Library; NDA= Nigerian Defense Academy; HE= High Extent; LE=Low Extent; U=Undecided; T=Total; ∑mean= Summation of Mean; Av. Mean= Average Mean.

Table 2 shows the extent to which Academic Libraries in Kaduna State Utilize Integrated Library Management Software (Perceived Ease of Use) for Service Delivery in the different sections of their libraries. Considering the average benchmark of 3.0, responses received are as follows: Circulation Section/Unit 2.7; Collection Development 2.5; Serial Control Unit 2.3; Reference Section 2.4; Cataloguing and Classification Section 2.6; Administrative Section 2.2; Reserved Section 2.2; and Electronic Section 2.5 respectively. The low response of below 3.0 benchmark on all sections of academic libraries in Kaduna State investigated for the extent of utilization of Integrated Library Management Software for service delivery was due to the inadequacy of required skills by library staff to utilize the software. Findings from this study underscores the assertion by Ajani and Buraimo (2022) who indicated that the performance of the academic librarians had improved by over 70% due to the use of Integrated Library Management Software for service delivery in South West, Nigeria. The low extent of ILMS utilization recorded

in this study agrees with by Oyovwe-Tinuoye and Omosekejimi, (2022) on a study carried out to investigate factors affecting the use of integrated library management software among users in Federal University Libraries. Findings revealed that: lack of proper guidance for library staff, lack of funds to support automation project by library management, shortage of computer systems designated for library OPAC, lack of required ICT skills, erratic electricity power supply/high cost of running electricity generating sets and lack of user training on how to use the library software are some factor responsible for low utilization. This implies that, if high utilization of ILMS would not be achieved, then high impact of service delivery through ILMS should not be expected. An effective ILMS provides computerization for all aspects of the library operation.

Challenges in the Utilization (Actual Use) of Integrated Library Management Software Service Delivery in Academic Libraries in Kaduna State.

The third objective is to identify the challenges in the Utilization of Integrated Library Management Software for operations and service Delivery in Academic Libraries in Kaduna State. The responses received are presented in Table 3

Table 3: Challenges in the Utilization of Integrated Library Management Software in Service Delivery in Academic Libraries in Kaduna State.

	AFIT				KIL				NDA				KASU				TOTAL		
Challenges of ILMS	NT	%	T	%	NT	%	T	%	NT	%	T	%	NT	%	T	%	TL	NT	T
Erratic power	16	12.0	8	6.0	29	21.8	29	21.8	7	5.3	7	5.3	15	11.3	22	16.5	133	50.4	49.6
Inadequate professional librarians to support projects	13	9.8	11	8.3	44	33.1	14	10.5	9	6.8	5	3.8	15	11.3	22	16.5	133	60.9	39.1
Lack of maintenance and support agreements	16	12.0	8	6.0	27	20.3	31	23.3	9	6.8	5	3.8	24	18.1	13	9.8	133	57.1	42.7
Poor ICT infrastructures	13	9.8	11	8.3	23	17.3	35	26.3	7	5.3	7	5.3	16	12.0	21	15.8	133	44.4	55.6
Poor funding	5	3.8	19	14.3	22	16.5	36	27.0	5	3.8	9	6.8	16	12.0	21	15.8	133	36.1	63.9
Poor ICT skills among library staff	17	12.8	7	5.3	27	20.3	31	23.3	4	3.0	10	7.5	16	12.0	21	15.8	133	48.1	51.9
Poor software selection decision	16	12.0	8	6.0	37	27.8	21	15.8	10	7.5	4	3.0	22	16.5	15	11.3	133	63.9	36.1
Lack of technical support from vendor	21	15.8	3	2.3	43	32.3	15	11.3	6	4.5	8	6.0	25	18.8	12	9.0	133	71.4	28.6
Technophobia	20	15.0	4	3.0	36	27.1	22	16.5	9	6.8	5	3.8	12	9.0	25	18.8	133	57.9	42.1
Fluctuating network	14	10.5	10	7.5	23	17.3	35	26.3	5	3.8	9	6.8	12	9.0	25	18.8	133	40.6	59.4
Inadequate computer systems	16	12.0	8	6.0	30	22.6	28	21.1	11	8.3	3	2.3	20	15.0	17	12.8	133	57.9	42.1
Lack of training of library staff	14	10.5	10	7.5	32	24.1	26	19.5	7	5.3	7	5.3	14	10.5	23	17.3	133	50.4	49.6
Lack of support by management	9	6.8	15	11.3	28	21.1	30	22.6	7	5.3	7	5.3	13	9.8	24	18.0	133	42.9	57.1

Source: Field Survey, 2024. **Key**: AFIT= Air Force Institute of Technology; KASU= Kaduna State University; KIL= Kashim Ibrahim Library; NDA= Nigerian Defense Academy; %= Percentage; T= Ticked; NT=Not Ticked; TL=Total.

Based on the 50% score benchmark, Table 3 revealed the challenges in the utilization of Integrated Library Management Software for service delivery in Academic Libraries in Kaduna State. Poor funding 63.9%; fluctuating network 59.4%; Lack of support by management 57.1%; Poor ICT infrastructures 55.6%; Poor ICT skills among library staff 51.9%; Erratic power 50%; and Lack of training of library staff 50%. Others are: Lack of maintenance and support agreements 42.7%; Technophobia 42.1%; inadequate computer systems 42.1%; inadequate professional librarians to support projects 39.1%; Poor software selection decision 36.1%; and Lack of technical support from vendor 28.6% respectively. The justification of a high response rate of over 50% on most of the challenges raised was the low influence of ILMS utilization for service delivery recorded in academic libraries in Kaduna State.

From the findings of this study, it reveals that the respondents agreed with identified challenges militating against the influence of ILMS utilization for service delivery in academic libraries in Kaduna State. This is in accordance with Oyovwe-Tinuoye and Omosekejimi, (2022) who pointed out that lack of awareness, poor Internet connectivity /low bandwidth, lack of information searching skills, lack of proper guidance from librarians, lack of funds to support automation project by library management, shortage of computer systems designated for library OPAC, lack of required ICT skills, complex OPAC interface design, erratic electricity power supply/high cost of running electricity generating sets and lack of user training on how to use the library software as factors affecting the use of integrated library management software among users in Federal University Libraries in Nigeria. This agrees with Kari and Baro (2014) who posited that "Lack of skilled manpower, lack of funding, lack of sufficient computer systems and erratic power supply are the major problems encountered while using library software." It then implies that, for the ILMS to be effective on the provision of library operations and services in academic libraries in Kaduna State and beyond, concerted effort should be made to surmount the identified or enumerated challenges as soon as possible.

Conclusion and Recommendations

The influence of integrated Library Management Software on service delivery in libraries can never be over stressed. The main thrust of every library is to adequately cater for the information needs of its users. If these needs are to be met effectively, then the adoption and full utilization of all the modules of ILMS is necessary so that operations and service delivery in our libraries will be strengthen through the acquisition of necessary software and hardware equipment, and proper training of the manpower that will run and sustain the system is not optional but mandatory. By way of recommendations, the training and retraining of library manpower should be a frequent and continuous exercise by academic library managers in Kaduna State. Library schools in Nigeria should incorporate practical training on the use of library software and other related technologies into their curriculums. There is need for power backups such as solar power, power inverters, standby generators, to complement and the national power supply companies in order to have an uninterrupted library system which delivers round the clock services. Software vendors should be committed to give technical support after the installation of the software. This will ensure to continuity of the project. In addition, academic libraries in Kaduna State should engage the services of Information Technology (IT) experts who will maintain and ensure the sustainability of the system.

References

Abbas K.D. (2014). Automation in Nigerian University Libraries: Mirage or Reality. *Information and Knowledge Management,* 4(4), 1–6.

Adamu, D. I., Ibrahim, U. & Gbaje, E. S. (2020). Reasons for Integrated Library Systems (ILS) Switching in Nigerian University Libraries. *Samaru Journal of Information Studies.* 20(1), 21.

Adegbore A.M. (2010). Automation in two Nigerian University Libraries. *Library Philosophy and Practice* .http://www.webpages.uidaho.edu/mbolin/adegbore.htm (Accessed October 23, 2022).

Ajani, F. O. & Buraimo O. (2022). Perceived Impact of Automation on University Library Services by Library Personnel in South West, Nigeria. *Information Development.* 38(2), 179-191.

Akeroyd, J. & Cox, A. (1999). "Integrated Library Management Systems: overview", VINE, 29(2), 3-10, https://doi.org/10.1108/eb040713. Retrieved January 20, 2022.

Alam, M.J. & Mezbah-ul-Islam, M. (2020), "Sustainability of Open Source Integrated Library Systems in University Libraries of Bangladesh: A Study", *Knowledge Management, Governance and Sustainable Development: Lessons and Insights from Developing Countries,* Routledge, New York, 68-80.

Anyira, I.E. (2020). Need for Adoption of Koha Integrated Library Management Software in Nigerian Academic Libraries. *Library Philosophy and Practice* (e-journal). https://digitalcommons.unl.edu/libphilprac/4140. Retrieved on 14/03/2023.

Aravind, S. & Kavitha, R. (2020). Issues and Challenges in Library Automation with Special Reference to Arts and Science Colleges - A Study. *Journal of Xidian University*, 14(4), 2347-2353.https://doi.org/10.37896/jxu14.4/260. Retrieved on 14/03/2023.

Atanda, L. A. (2018). Impact of Library Automation in Nigerian Universities. *Research Journal of Library and Information Science*. 2(4), 21-25.

Ayodele, R. (2015). Assessment of Library Application Software Packages for Library Operations and Services in Federal University Libraries in North Western States of Nigeria. A Thesis Submitted to the School of Postgraduate Studies Ahmadu Bello University, Zaria In Partial Fulfillment of the Requirements for the Award of Degree of Master of Information Science.

Bozimo, D. O. (2006). ICT and the Ahmadu Bello University Libraries. *Nigerian Libraries*: *Journal of the Nigerian libraries Association,* 1(20).

Chow, A. S. & Bucknall, T. (2012). Emerging technology trends in libraries. *Library Technology and User Services.* https://doi.org/10.1016/b978-1-84334-638-8.50006-0. Retrieved on 13th October 2022.

Emasealu H.U. (2019). Automation of Academic Libraries and Web Development: A Reverie or Reality. *International Journal of Knowledge Content Development and Technology*, 9(1), 43–56.

Hamisu, A. (2021). "Evaluating the Adoption and Utilization of Library Automation: A case study of Federal Colleges of Education North West, Nigeria (2019)". A Dissertation Submitted to the University of Gezira of the Requirement for the Award of the Degree of PhD in Library and Information Science.

Kari, K.H. & Baro, E.E. (2014).The Use of Library Software in Nigerian University Libraries and Challenges. *Library Hi Tech News. Pp. 15-20.* DOI 10.1108/LHTN-09-2013-0053. Retrieved on 14/03/2023

Müller, T. (2011). 'How to Choose a Free and Open Source Integrated Library System', *OCLC Systems & Services: International Digital Library Perspectives*, 27(1), 57-78.

Olakoge D.P. & Kolawole J.A. (2019). Effect of Library Automation on Performance of Librarians in Private Universities in South-West Nigeria. *Information and Knowledge Management,* 9(5), 1–11.

Olatunji, S. O. & Tiamiyu, M. A. (2022). "Evaluation of the Adoption and Use of Integrated Library Management Software in Selected Private University Libraries in Osun State, Nigeria" *Library Philosophy and Practice (e-journal)*. 7098. https://digitalcommons.unl.edu/libphilprac/709. Retrieved on 14/03/2023.

Oludipe, J.T. & Babafemi, G.O. (2019). Automation of Academic Library: Challenges and Prospects. *Journal of Library, Science Education and Learning Technology (JOLSELT), 1(1), 89-101.*

Onohwakpor, J.E. & Anre, O.S. (2007). "Software Selection and Acquisition in Nigerian University and Special Libraries: The Way Forward", *Computing and Information Systems*, 11(1), 11-18.

Otunla, A.O. & Akanmu-Adeyemo, E.A. (2010). Library Automation in Nigeria: The Bowen University Experience. *African Journal of Library and Information Science*, 20(2), 93-102.

Oyedokun, T.T. Oyewumi, F. A, Akanbi, M. L., & Laaro, D. M. (2018). Assessment of ICT Perceived Ease of Use to End User Satisfaction with Enterprise Resource Planning Systems. *Computers in Human Behaviour*. 20(4), 505–515. Retrieved on 14/03/2023.

Oyovwe-Tinuoye, G.O. & Omosekejimi, A.F. (2022)."User Perception of the Use of Integrated Library Software for Service Delivery in Federal University Libraries in the Niger Delta, Nigeria". *Library Philosophy and Practice* (e-journal). 6856. https://digitalcommons.unl.edu/libphilprac/6856. Retrieved on 14/03/2023.

Uzomba E. C., Oyebola O.J. & Izuchukwu A.C. (2015). The Use and Application of Open Source Integrated Library System in Academic Libraries in Nigeria: Koha Example. *Library Philosophy and Practice (e-journal).*Paper 1250. Available at: http://digitalcommons.unl.edu/libphilprac/1250 (Accessed October 23, 2022).

ASSESSMENT OF THE ADOPTION AND UTILISATION OF RFID-BASED LIBRARY MANAGEMENT SYSTEMS IN SELECTED UNIVERSITY LIBRARIES IN SOUTH-WEST STATES OF NIGERIA

Joseph Olubunmi Olorunsaye,
Babcock University

Abstract

The study investigated assessment of adoption and utilisation of RFID-based library management systems in selected university libraries in south-west states of Nigeria. The objectives was to find out the types of RFID-based library management systems used, find out the RFID-based library management systems frequency used and the purpose of RFID-based Library Management Systems used in University Libraries in South-West States of Nigeria. The quantitative and survey research design was used. The population comprised 208 librarians in the public university libraries across seven public university libraries using RFID-based LMS in South-West, States of Nigeria were used. Total enumeration was used. Structured and validated questionnaire was used for data collection. Cronbach's alpha reliability coefficients for the constructs ranged from 0.77 to 0.94. Return rate was 100%. Descriptive and inferential statistics were used for data analysis at 5% significance level. The findings revealed that Security Gates, Inventory Management Systems are the most commonly used. Security Gates and locate books through online catalogues was the main reason behind for the use of RFID-based library management systems. The study concluded that university libraries in South-West, States of Nigeria adopt and utilise RFID-based Library Management Systems but to varying degrees, with security applications such as Security Gates being the most prevalent. The study recommended among others that University libraries should subscribe to the use of the less expensive and passive type of RFID-based LMS. Integrate with Artificial Intelligence (AI), Robotic Technologies and Internet of Things (IOT) for smart shelf management.

Keywords: Adoption, Assessment, Library Management Systems, Utilisation, University Libraries, South West States, Nigeria

Introduction

The use of Radio Frequency Identification (RFID)-based Library Management Systems (LMS) is becoming a subject of great concern for organisations like schools, colleges, and even university libraries. It is changing the way librarians and library users communicate with the library content and promoting faster and more reliable access to information resources, with a high level of user satisfaction in libraries. Notwithstanding, the significance of RFID-based Library Management Systems to securing and managing acquired user-centric pricey resources in university libraries. The slow and low level of use poses serious challenges to the security and management of user-centric resources (Gladness, & Ibrahim, 2025), thus making RFID-based Library Management Systems very insignificant in libraries.

According to Ashikuzzaman (2024), in Gladness and Ibrahim (2025) RFID-based Library Management Systems is a self-service technology, design for identifying, tracking, or theft detection, and managing objects, or people or animals through wireless communication. RFID-

based Library Management Systems is a relational database customised for use in running a library and supporting its routines. The changing nature of the university library environment globally in the 21st century as a result of RFID-based LMS use, demands its definite status of use at the university libraries, Nigeria for optimum security of library and information resources. Researchers have observed that many university libraries in Nigeria are still relatively slow in the use of RFID-based LMS. This may be due to a lack of empirical evidence regarding the understanding of the influence of type, frequency, and purpose of RFID-based LMS in use. Against this backdrop, this study aimed to investigate the influence of type, frequency, and purpose on the low level of RFID-LMS use in selected university libraries in South-West States of Nigeria.

Statement of the Problem

RFID-based Library Management System is a relational database customised for use in running a library and supporting its routines. The changing nature of the university library environment globally in the 21st century, as a result of RFID-based LMS use, demands its definite status of use in university libraries in Nigeria for the optimum security of library and information resources. Despite the global significance of the RFID-based Library Management System to combat the theft of documents and as an access control systems, the use was observed by the study researcher as low. Yet, the concept of Radio Frequency Identification (RFID)-based Library Management System stems from the need to use it to facilitate the time-consuming task of library staff, fast issuing, reissuing and returning of books with the help of RFID-enabled modules (Garba, 2019; Negi & Pant, 2024) in Patil (2024). The low use may be due to a lack of empirical evidence regarding the understanding of the challenging influence of type, frequency, and purpose of RFID-based LMS in use. Against this backdrop, this study aimed to investigate the influence of type, frequency, and purpose on the low level of RFID-based LMS use in selected university libraries in the South-West States of Nigeria.

Objectives of the Study

The following objectives of the study to guide the study:

1. To find out types of RFID-based Library Management Systems used in University Libraries in South-West States of Nigeria
2. To determine the RFID-based Library Management Systems frequency used by University Libraries in South-West States of Nigeria
3. To uncover the purpose of RFID-based Library Management Systems used in University Libraries in South-West States of Nigeria

Literature Review

The use of Radio Frequency Identification (RFID) technology is turning out to be an integral part of our daily lives. It is offering an intelligent library management system that improves service quality while providing immediate and effective benefits to both library management and users. It can be used in libraries for book identification, self-checkout, anti-theft control, and informing users about their library status (Okwu et al., 2025). These applications can result in significant labour cost savings, improved customer service, reduced book theft, and a continuous record update of new book collections.

Its introduction to the library is now making RFID libraries extremely important to people, and has proven to be a promising alternative in relieving the library staff from time-consuming routines

(Hamad, 2024). Its global significance is to support the intolerable manual inventory of hundreds of thousands of items in the library within a few days, the inconvenience of checking out and returning library collections any time of the day, missing books, mutilation and mis-shelving of library resources posing a serious challenge to the security and management of pricey user-centric resources daily (Okubanjo et al., 2021). The use of Radio Frequency Identification-based Library Management System continues to be a prevalent issue globally, posing significant challenges across all disciplines and public university libraries. The use of Radio frequency identification is essential to the management and security of library resources for effective teaching, learning, and research of the patrons.

In a study titled, "Radio Frequency Identification (RFID)-based Library Management System" conducted in Osogbo, Osun State University Library, by Yusuf et al. (2023) in Mohammed (2023). Which was to experiment an in-house Radio Frequency Identification-based library management system that will help librarian manage the shelves with less human involvement. The finding shows a Library Management System based on Radio Frequency Identification (RFID) and developed detection to improve library use and management. To efficiently identify and manage the books, and make use of the RFID reader. The student can search the database and, if the book is available, pick it up from the library because the database displays the book's availability at the library. Oguedoihu and Adinchezor (2022) in Abdulsalam et al. (2025) investigated library and information services and security challenges in two selected academic libraries in Oko, Anambra State and Nekede, Imo State, South East, Nigeria. The study was guided by four research questions. The study revealed that library staffs of the two selected academic libraries were aware of their security challenges but ineptitude to salvage the situation. The management of the two selected academic libraries should therefore avail adequate safety measures for library resources. The study also noted that since the need for security measures is very important to safeguard library materials, better attention should be given to security in library and information services to forestall destruction of library resources. The study concluded that library staff was aware of different types of security measures available in both conventional and electronic systems, that library management has to make a positive move towards improving the security system to avoid damages or losses of library resources, and it was recommended that management of the two institutions studied should provide security systems to protect library resources from crime, installation of CCTV, RFID, video recording surveillance and other electronic measures to monitor the library space for unwanted activity or theft. In another study, Irankunda et al. (2021) and Rajasree (2025) discussed the development of the RFID-based library management and antitheft system: A case of the East African Community (EAC) Arusha-Tanzania region. Radio Frequency Identification (RFID) Systems are becoming very useful in our daily lives due to their advantages such as reduction of human error, theft prevention, time-consuming reduction, the auto identification of targeted objects, business processes automation etc. RFID systems have been applied in libraries to manage items and library operations. Different approaches have been adopted in Library Management System in the East African region, unfortunately, some challenges including theft, page removal, non-customer satisfaction, high cost of used system etc. are persisting. To address these challenges, an RFID-based library management and anti-theft system has been developed for the East African Community (EAC) library. It focused on the use of the Ultra High Frequency (UHF) band which enables readers and tags to transmit and receive data at long range. The developed system facilitates users to borrow and return

library items using RFID modules and enables librarians to monitor, and record library activities and prevent no issued items from crossing the library entrance or exit. A survey was conducted to identify which Library Management System were mostly used in the region. The results showed that 61% of libraries were computerized which means the use of ICT technology has been integrated into library management and 39% were using manual methods. However, the data collected from respondents illustrates that libraries are using different computerized methods such as software (51.9 %) while Q-R technology is not mostly used (0%). Literature suggests that RFID-based LMS can enhance library efficiency, security, and user satisfaction, though further research is needed on the type, frequency and purpose of use.

Methodology

This study adopted a survey research design. Seven public university libraries using RFID-based LMS in South-West, States of Nigeria were used. The population comprised 208 librarians in the public university libraries in South West, Nigeria (Federal University of Agriculture, Abeokuta, Obafemi Awolowo University, Ile-Ife, Ladoke Akintola University of Technology, Ogbomoso, Lagos State University, Ojo, Olabisi Onabanjo University,Ago Iwoye, Oyo State Technological University, Ibadan and Lagos State University of Science and Technology (LASUSTECH) Ijanikin, Lagos) totalling 208 librarians. Total enumeration was used. Structured and validated questionnaire was used for data collection. Cronbach's alpha reliability coefficients for the constructs ranged from 0.77 to 0.94. Return rate was 100%. Descriptive and inferential (multiple and simple regression) statistics were used for data analysis at 5% significance level. A self-constructed and adapted questionnaire was used to collect data for this study. The questionnaire is divided into six (6) main sections of A, B, C, D, E, and F. To ascertain the reliability of the study, a pilot study was conducted among the Librarians and Library Officers in the University of Ilorin University Library, Kwara State, the overall Cronbach's alpha for the 56 items is 0.85. The methods of data analysis entailed descriptive statistics of frequency count, mean, and standard deviation. The result analysis was based on 208 copies of the questionnaire that were distributed and filled out correctly, with a return rate of 100%. This was possible through the help of resident contact persons in each of the institutions. An electronic copy of the validated questionnaire was sent to the contact persons with a motivation fee to help print and administer to the targeted audience. The administered questionnaire was afterwards sent back to the researcher via a courier service for data analysis.

Results and Discussion

Socio-demographic variables of the respondents

The socio-demography of the respondents is presented in Table 2. These include age, gender, marital status and designation.

Table 1: Socio-demography of the respondents

Age	**Frequency**	**Percent**
20-29	37	17.8
30-39	34	16.3
40-49	68	32.7
50-59	53	25.5
60-69	16	7.7
Gender	**Frequency**	**Percent**
Male	103	49.5
Female	105	50.5
Marital Status	**Frequency**	**Percent**
Married	166	79.8
Single	42	20.2
Designation	**Frequency**	**Percent**
Assistant Chief Library Officer	6	2.9
Acting University Librarian	3	1.4
Assistant Librarian	12	5.8
Cataloguing Librarian	2	1.0
Deputy University Librarian	1	.5
Higher Library Officer	23	11.1
Librarian I	33	15.9
Librarian II	16	7.7
Library Assistant	7	3.4
Library Officer	50	24.0
Principal Librarian	18	8.7
Principal Library Officer	8	3.9
Senior Librarian	19	9.1
Senior Library Officer	9	4.3
University Librarian	1	.5
Total	**208**	**100.0**

The key demographic variables gathered in this study were age, gender, marital status, and designation. Data gathered indicated that most of the respondents fall within the 40–49 years age group (32.7%). This is followed by the 50–59 years group (25.5%). The youngest category, 20–29 years, constitutes 17.8% of the respondents, while the 30–39 years group makes up 16.3%. The least represented age category is 60–69 years (7.7%). As far as the gender distribution is concerned, data showed a relatively balanced proportion where the male respondents constituted 49.5% and the female respondents 50.5%. In terms of the marital status of the respondents, a significant proportion of the respondents are married (79.8%), while 20.2% are single. Respondents' designations showed that they hold diverse positions within the library system. The most common designation is Library Officer (24.0%), followed by Librarian I (15.9%), and Higher Library Officer (11.1%). Senior positions such as Deputy University Librarian (0.5%) and University Librarian (0.5%) are the least represented. However, the library professionals as the targeted audience were covered and represented in all institution using the RFID-based library management system.

Objective one: Types of RFID-based Library Management Systems are used in university libraries in South-West States of Nigeria

The first objective of this study is to identify the types of RFID-based Library Management Systems used in university libraries in South-West States, Nigeria, is presented in Table 1

Table 3: Types of RFID-based LMS used for library service

S/N	TYPES OF RFID-based LMS	Yes (F)	Yes (%)	No (F)	No (%)
1.	Security Gates	154	74.0	54	26.0
2.	Inventory Management Systems	140	67.3	68	32.7
3.	Automated Book Returns	126	60.6	82	39.4
4.	RFID Tags	106	51.0	102	49.0
5.	Active RFID-based LMS	105	50.5	103	49.5
6.	Self-Service Check-Out Stations	96	46.2	112	53.8
7.	Handheld scanners	79	38.0	129	62.0
8.	Passive RFID-based LMS	77	37.0	131	63.0

Table 1. presented responses based the objective that identified the types of Radio Frequency Identification (RFID)-based Library Management Systems (LMS) currently in use within university libraries in South-West States of Nigeria. Respondents were asked to specify the particular types of RFID-based LMS they utilise. The finding shows that Security Gates are the most commonly used, reported by 74% of respondents, suggesting a strong emphasis on security and prevention of unauthorized book removal in these libraries. Additionally, 67.3% of the respondents reported using Inventory Management Systems, indicating that RFID technology is also widely adopted by 60.6% of the libraries, highlighting efforts to streamline the book return process and minimize the need for manual handling. Table 1 also reveals that a slight majority of the respondents (51%) reported using RFID Tags, indicating a notable reliance on tagging library materials for automated identification and tracking. However, this usage rate is relatively low when compared to the expectation that RFID tags should be a fundamental component of RFID-based Library Management Systems (LMS). Similarly, 50.5% of respondents indicated the use of Active RFID-based LMS, which is marginally more common than Passive RFID-bade LMS, reported by only 37% of respondents. This suggests a preference for systems that enable real-time location tracking of library materials, as offered by Active RFID technology.

In contract, Self-Service Check-Out Stations are used by 46.2% of libraries, reflecting moderate adoption and implying that traditional, self-staff-assisted check-out methods are still widely practiced. Additionally, Handheld Scanners (38%) and Passive RFID-based Library Management Systems (37%) are among the least utilized tools. The relatively low adoption of Passive RFID systems and handheld scanners may be attributed to budgetary constraints or a strategic preference for more technologically advanced solutions such as Active RFID, despite their higher cost. The preference for Active RFID over Passive RFID could also reflect a lack of adequate training or awareness among library staff and decision-makers about the cost-effectiveness and suitability of different RFID types for specific library operations. This inadvertent preference may be a result of misinformed procurement decisions or insufficient

understanding of the practical applications and implications of each system. Therefore, the findings implies that there is need for targeted training and awareness programs to support more informed and cost-effective adoption of RFID technologies in university libraries.

Objective two: Uncover RFID-based Library Management Systems frequency used by university libraries in South-West States of Nigeria

The aim is to find out the frequency of RFID-based Library Management Systems used in university libraries in South-West, States of Nigeria, is presented in Table 2.

Table 2: Frequency of RFID-based LMS used for library service

S/N	**FREQUENCY OF RFID-BASED LMS USE**										
	How often do you …	**VF(F)**	**VF (%)**	**F (F)**	**F(%)**	**LF(F)**	**LF (%)**	**NaA(F)**	**NaA(%)**	**Mean(x̄**	**S. D**
1	Make use of security gates?	45	21.6	67	32.2	25	12	71	34.1	2.41	1.16
2	Make use of RFID-based LMS tags?	41	19.7	52	25	32	15.4	83	39.9	2.24	1.17
3	Make use of inventory management systems?	38	18.3	40	19.2	77	37	53	25.5	2.3	1.04
4	Make use of an active RFID-based LMS?	35	16.8	56	26.9	37	17.8	80	38.5	2.22	1.13
5	Make use of a passive RFID-based LMS?	35	16.8	46	22.1	39	18.8	88	42.3	2.13	1.14
6	Make use of automated book returns?	26	12.5	73	35.1	18	8.7	91	43.8	2.16	1.12
7	Make use of self-service check-out stations?	24	11.5	65	31.3	36	17.3	83	39.9	2.14	1.07
8	Make use of handheld scanners?	21	10.1	58	27.9	32	15.4	97	46.6	2.01	1.07
	Weighted mean									**2.20**	

Key: VF (Very Frequently), F (Frequently), LF (Less Frequently), N (Non at All)

Data from table 2 seeks to identify the frequency of different RFID-based Library Management Systems (LMS) within university libraries in South-West States of Nigeria. Respondents were asked to specify the frequency of Radio Frequency Identification (RFID)-based Library management Systems (LMS) currently use within university libraries in South-West States of Nigeria. The finding shows that the RFID-Based LMS are less frequently used based on the

weighted mean of 2.20. The respondents use Security Gates ($\bar{x}$ =2.41) more frequently than the others. Inventory Management Systems ($\bar{x}$ =2.30) are also used less frequently, just as RFID Tags ($\bar{x}$ =2.24) and Active RFID-based LMS ($\bar{x}$ =2.22), Self-Service Check-Out Stations ($\bar{x}$ =2.14), Automated Book Returns ($\bar{x}$ =2.16) and Passive RFID-based LMS ($\bar{x}$ =2.13) and Handheld Scanners ($\bar{x}$ =2.01) which all had below 2.5 mean threshold for a 4 Likert type scale used in measuring the use frequency. The low frequency of use may be due to cost, incoherent and inadequate education, lack of technical expertise, or inadequate infrastructure in some libraries.

Objective three: Determine the purpose of RFID-based Library Management Systems used in university libraries in South-West States of Nigeria

Key: SA (Strongly Agree), A (Agree), D (Disagree), SD (Strongly Disagree)

Table 3: Purpose of Use of RFID-based LMS

S/N	Purpose of RFID-Based LMS Use	SA(F) (%)	A (F) (%)	D(F) (%)	SD (F) (%)	Mean($\bar{x}$)	S. D
1.	I used to locate books through online catalogues.	76 (36.5 %)	83 (39.9 %)	32 (15.4 %)	17 (8.2 %)	3.04	0.92
2	I use library RFID-LMS to prevent unauthorised removal of library materials.	64 (30.8 %)	91 (43.8 %)	28 (13.5 %)	25 (12 %)	2.93	0.96
3	I use the RFID-LMS for tracking the circulation of books.	61 (29.3 %)	71 (34.1 %)	59 (28.4 %)	17 (8.2 %)	2.84	0.94
4	I use the RFID-LMS for accurate self-check-in and check-out of books.	54 (26%)	79 (38%)	64 (30.8 %)	11 (5.3 %)	2.84	0.87
5	I use RFID-LMS for organising the library's collection.	50 (24%)	74 (35.6 %)	67 (32.2 %)	17 (8.2 %)	2.75	0.91
	Weighted mean					**2.85**	

The data addressing the third objective question was presented in Table 3. This objective seeks to identify the purpose of Radio Frequency Identification (RFID)-based LMS currently in use in South-West States Univsersity libraries of Nigeria. Respondent were asked to identify the purpose of RFID-based LMS they utilise. The finding shows variants purposes such as, to locate books through online catalogues ($\bar{x}$ =3.04) which has the highest mean score. Other purposes include preventing unauthorized removal of materials ($\bar{x}$ =2.93), tracking circulation of books ($\bar{x}$ =2.84) and self-check-in and check-out ($\bar{x}$ =2.84) have similar mean scores, implying that RFID is moderately used for circulation management but is not fully optimized, organizing the library's

collection ($\bar{x}$ =2.75) and conducting rapid shelf inventory ($\bar{x}$ =2.71) which all had above the mean threshold of 2.5 used as the threshold for the 4 Likert type scale used to measure responses. The results indicated that RFID-based LMS in university libraries in South-West, States of Nigeria are primarily used for book tracking, security, and locating materials through online catalogues. Their use for organizing collections and shelf inventory is relatively low suggesting that while RFID is beneficial for library operations, some functions (such as inventory management and collection organization) may not be fully integrated or regularly utilised, possibly due to technical limitations or staff training gaps.

Discussion of the findings

Types of Radio Frequency Identification (RFID)-based Library Management Systems (LMS) currently used in university libraries across South-West, States of Nigeria

The findings indicated that the most widely used RFID-based LMS was Security Gates. This suggests that most university libraries prioritise security measures to prevent unauthorized book removal but apparently unaware of the most appropriate type to use. This finding aligns with existing literature, which emphasizes the role of RFID technology in enhancing library security by minimizing theft and unauthorized borrowing (Okuanjo et al., 2021 and Olagbenga 2023). The widespread use of security gates implies that university libraries in the region recognize the importance of securing their collections and are leveraging RFID technology to address security concerns effectively. In addition, handheld Scanners and Passive RFID-based LMS are among the least used technologies. The lower adoption and utilisation of these tools may stem from financial constraints, inappropriate education or a corrupted preference for more advanced tracking systems that offer real-time monitoring.

Frequency on the Use of Radio Frequency Identification (RFID)-based Library Management Systems (LMS)

The overall frequency of use indicates that RFID-based LMS are generally used less frequently. This may suggest the reason for the use of Security Gates as the most frequently utilised RFID-based LMS. This is consistent with findings from (Okwu et al., 2025; Kiran et al., 2024) who affirmed that libraries are contending with security issues and that security gates powered by RFID is important in libraries. Passive RFID-based LMS and Handheld Scanners were among the least frequently used systems. The low utilisation rates of these technologies may be attributed to several factors. The literature supports these findings, highlighting that the successful implementation of RFID-based LMS is often hindered by financial constraints, inappropriate infrastructures, technical challenges, and resistance to change (Enyi and Tsebga 2021). The limited use of RFID-based LMS in Nigerian university libraries aligns with broader challenges in developing countries, where resource limitations impact technological adoption and integration (Hamad, et al., 2024; Okubanjo et al., 2021).

Purpose of Using of RFID-Based Library Management Systems in University Libraries in South-West, States of Nigeria

The results indicated that RFID-based LMS in university libraries in South-West, States of Nigeria are primarily used for book tracking, security and locating materials through online catalogues. Their use for organizing collections and shelf inventory is relatively low suggesting

that while RFID is beneficial for library operations, it may not be fully utilized, possibly due to technical limitations or staff training gaps.

The findings aligned with the literature which indicates that RFID-based Library Management Systems serve multiple functions in modern libraries. Such include what was documented by (Patil et al., 2024; Solanke,2021;) who posits that RFID enhances accessibility and security, which supports the finding that libraries use RFID primarily for locating books and preventing unauthorized removals. Abdulsalami et al., (2025) suggests that to maximize RFID's effectiveness, libraries must invest in staff training, technical support, and infrastructure development. Without these, libraries may not fully mitigate through strategic planning realize the benefits of RFID for organizing collections and conducting rapid shelf inventories.

It is also noted that the purpose of use of RFID-based LMS in Nigeria is the same as what it was used for in other developed countries' libraries. Libraries in developed nations have reported greater success with RFID integration due to better funding and more structured implementation strategies (Nirudi, 2025). Nigerian university libraries could benefit from adopting similar approaches, such as phased implementation, partnerships with technology providers, and continuous professional development for library staff. With these measures, RFID-based LMS could be optimized for both security and efficient library management in Nigerian universities.

Conclusion and Recommendations

Based on the findings of this study, it can be concluded that university libraries in South-West, States of Nigeria adopt and utilise RFID-based Library Management Systems but to varying degrees, with security applications such as Security Gates being the most prevalent. Based on the findings of the study, the following recommendations are made: university librarians should subscribe to the use of the less expensive and passive type of RFID-based LMS. Integrate with Artificial Intelligence (AI), Robotic Technologies and Internet of Things (IOT) for smart shelf management. The heads of libraries should subscribe to more frequently use of handheld scanners and Passive RFID-based LMS type in the library. Artificial Intelligence, mobile RFID apps for users to self-checkout via smart phones and RFID for predictive analytics such as popular book demands. The library professionals should therefore be regularly trained on these tools' benefits and applications to increase their usage for better efficiency in managing the library materials and head of libraries should purposely explore the optimal use of RFID-based LMS for organizing collections and conducting rapid shelf inventory.

References

Abdulsalami, L.T., Ado, M.B. Obande, B.O., & Omorogbe, O.H. (2025): The Adoption of Robotics for Library Security and Surveillance: An Overview: OMANARP INTER. J. Lib & Info Science. Vol.1, Issues II Pp.123 -134-May,.2025

Enyi, K. E., & Tsegba, J. F. (2021). Effect of security challenges on library resources in the Federal University of Lafia Library, Nasarawa State. *International Journal of Library and Information Services (IJLIS), 10*(2), 1-10.

Gladness, K. & Ibrahim, Z. (2025). Investigating Ineffectiveness of Electronic Security

Systems in Safeguarding Library Materials at Mzumbe University Library: Challenge Of Using Electronic Security Systems In Academic Libraries. International Journal of

Librarianship, 10(1). https://doi.org/10.23974/ijol.2025.vol10.1.438

Hamad, F., Al-Fadel, M. and Shehata, A.M.K. (2024), "The level of digital competencies for the provision of smart information service at academic libraries in Jordan", *Global Knowledge, Memory and Communication*,73(4/5):614-633. https://doi.org/10.1108/GKMC-06-2022-0131IFLA. (2023). Emerging technologies in library security. IFLA Reports. https://www.ifla.org/xxxx

Negi, U. & Pant, M.J. (2024). Awareness and Satisfaction of Users towards RFID based Circulation System: a study. *College Libraries.* 39 (I) March 2024

Nirudi, D. Y. (2025). Evolution of User Satisfaction with RFID in Libraries: Case Study of NITHM Library. *Available at SSRN 5080871*.

Mohammed, S. Q., Abdullah, M. N. & Al-Araji, A. S. (2023). One decade of radio frequency identification (RFID) Network Planning (RFID-NP), *Measurement: Sensors*, Vol.26,2023,100696, ISSN26659174,https://doi.org/10.1016/j.measen.2023.100696. (https://www.sciencedirect.com/science/article/pii/S2665917423000326)

Okubanjo, 1, A., Okandeji, A., Osifeko, O., Onasote, A. & Olayemi, M. (2021). Development of a Hybrid Radio Frequency Identification (RFID) and Biometric Based Library Management system. *Journal of Science* 35(2): 567-584 (2022) DOI: 10.35378/gujs.834087

Okwu, E.,Olise, C. & Umahi, B. O. (2025). Adoption of Digital Technologies and Librarians' Service Delivery in Federal University Libraries in South-East, Nigeria. *International Journal of Educational Research & Practice.*, 12,(1)103-114. ISSN: 2713 – 2822.

Olagbenga, S. J., Sani, R. M. & Dangani, B. U. (2023). Utilization of radio frequency identification technology for privacy and security of information resources in universities in Katsina State. *Samaru Journal of Information Studies*, 23(1) 27-38

Patil, S.S., Manjunath G.D., Pooja, R.M., Jyoti.P. & Nataraj, W.(2024). Unlocking Efficiency: The Role of Radio Frequency Identification (RFID) Technology in Modernizing Library Management system. *International Journal of Research in Library Science* (IJRLS). 10 (4):57-66, DOI: 10.26761/IJRLS.10.4.2024.1795

Rajasree, O. P. (2025). Information Technology Intervention in Library and Information Services. *Asian Journal of Multidimensional Research*. Vol. 14 (3),ISSN: 2278-4853

Solanke, M. D. S. (2021). RFID technology in libraries. *Int. J. Res*, *8*, 90-97.

PERCEPTION OF ENTREPRENEURSHIP EDUCATION IN LIBRARY AND INFORMATION SCIENCE BY POSTGRADUATE STUDENTS IN AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA

ADAMU Saad Kwairanga CLN
Ahmadu Bello University, Zaria

Professor Tijjani Abubakar
Ahmadu Bello University, Zaria

Dr. Hayatu Mohammed Musa
Ahmadu Bello University, Zaria

Abstract

This study examines the Perception of Entrepreneurship Education in Library and Information Science by Postgraduate Students in Ahmadu Bello University, Zaria in order to achieve this; three research objectives were raised. Identify the various types of entrepreneurship skills available within the field of Library and Information Science; asses the perception of postgraduate students in the Department of Library and Information science, ABU Zaria regarding the relevance of the entrepreneurship and investigate the factors that influence skills acquisition among postgraduate students in the Department of Library and Information Science. Quantitative research method and cross-sectional research design were adopted. The population of the study comprises the postgraduate students of the department of library and information Science ABU Zaria. Which are 246. The research employed a total population sampling technique, allowing for the use of the entire population. A Self-developed questionnaire was used as a research instrument for data collection. Data collected were analyzed using frequency, percentage mean and standard deviation. Finding shows that, information organization and retrieval are the prevalent entrepreneurship education skills in the field of Library and Information Science. Also, it indicates that entrepreneurship education contributes to the development of managerial competences among student in small scale business management in the field of Library and Information Science. The finding also revealed that curriculum design and content were perceived by postgraduate students as the most information science factor in skills acquisition within the department of Library and Information science Ahmadu Bello university. It was concluded that this study has provided valuable insight into the perception of postgraduate students regarding entrepreneurship education within the field of Library and Information Science. It was recommended that department should Incorporate training modules on social media management and public engagement policies within the entrepreneurship education curriculum to enhance students leveraging digital platforms for effective communication. Establish partnerships with industry experts in social media marketing for practical insight. It is also recommended that the department should enhance the curriculum to focus on practical entrepreneurial skills development, including business planning, marketing strategies and financial management.

Keywords: Ahmadu Bello University Zaria, Department of Library and Information Science ntrepreneurship Education, Perception, Postgraduate Student, Skills Acquisition,

Introduction

Entrepreneurship education has become an integral component of modern higher education, with its inclusion in Library and Information Science (LIS) programs aimed at equipping students with practical, business-oriented skills for a rapidly evolving information economy. Within LIS education, particularly at Ahmadu Bello University, Zaria, entrepreneurship education now encompasses areas such as information organization and retrieval, cataloguing and classification, collection development, database and metadata management, digital preservation, publishing and book trade, user experience design, and public engagement through social media. These areas present significant opportunities for entrepreneurial ventures in the knowledge and information services sectors (Ibrahim, 2024).

Thus, postgraduate students' perception of entrepreneurship education plays a significant role in its effectiveness and relevance. Barkindo et al (2021) assert that positive attitudes and strong motivation among students are essential in translating classroom learning into real-world entrepreneurial outcomes. At Ahmadu Bello University, many students view entrepreneurship education as a means of gaining intellectual and managerial competencies necessary for managing small-scale enterprises, including planning, decision-making, staff training, and critical problem-solving. These programs help students to navigate the complexities of today's business world and prepare them for self-reliance in the increasingly competitive information sector (Joseph & Adewunmi, 2020). Furthermore, entrepreneurship education has been shown to enhance students' ability to innovate and adapt, especially in dynamic and technology-driven environments (Olanrewaju, 2024).

Despite its potential, there are challenges in the implementation and effectiveness of entrepreneurship education, necessitating strategic interventions. Barkindo, Chioma, and Abdullahi (2021) recommends approaches such as curriculum integration, experiential learning, mentorship, and resource access to improve student outcomes. Additionally, strategies like guest lectures, entrepreneurship competitions, and cross-disciplinary collaborations can further enhance student engagement and innovation (Neck & Greene, 2011). Abdullahi, Barkindo & Chioma, (2021) argued that there is need for a reorientation of Nigeria's higher education curricula to align with the realities of economic diversification and graduate self-employment, particularly in LIS education. These insights suggest that for entrepreneurship education to yield its full impact at Ahmadu Bello University, a comprehensive and dynamic approach involving continuous evaluation, stakeholder involvement, and policy support is necessary (Adebayo & Kolawale, 2023).

Statement of the Problem

Ideally, entrepreneurship education in Library and Information Science (LIS) programs is expected to equip students with the requisite knowledge, skills, and mindset to identify, create, and manage innovative information-based enterprises. When effectively implemented, such education fosters self-reliance, economic productivity, and enhances graduates' employability by bridging the gap between academic knowledge and real-world application (Neck & Greene, 2011). In advanced academic settings, entrepreneurship education has successfully encouraged students to transform theoretical concepts into viable business solutions, particularly within fields like

digital archiving, information consultancy, metadata management, and user-centered service design.

It was observed that many graduates now pursue postgraduate studies not out of academic interest but due to the scarcity of jobs, highlighting a disconnect between the goals of entrepreneurship education and the realities of the labor market. At institutions like Ahmadu Bello University, Zaria, postgraduate students in Library and Information Science (LIS) programs often lack the practical entrepreneurial skills needed to establish or manage viable information-based enterprises. Despite entrepreneurship being part of the curriculum, challenges such as inadequate industry exposure, lack of mentorship, and limited hands-on experience persist, leading students to undervalue its relevance to their careers (Barkindo, Chioma, & Abdullahi, 2021). This situation calls for a thorough examination of the forms of entrepreneurship education offered, students' perceptions of its relevance, and strategies to improve its effectiveness within the LIS department.

Research Questions

The following research question guided the study:

1. What types of Entrepreneurship Education are available in the field of Library and Information Science at Ahmadu Bello University, Zaria?
2. How do postgraduate students in the Department of Library and Information Science, Ahmadu Bello University, Zaria, perceive the relevance of Entrepreneurship Education in the field?
3. What strategies could be implemented to enhance Entrepreneurship Education in the Department of Library and Information Science at Ahmadu Bello University, Zaria?

Literature Review

In an era marked by rapid technological advancement and information proliferation, information literacy and research skills are cornerstone competencies for Library and Information Science (LIS) professionals. These essential skills enable librarians to navigate, critically assess, and effectively utilize diverse information sources, which is fundamental in tasks such as market research, user needs assessment, and feasibility studies for entrepreneurial ventures within library contexts. Mastery of these skills ensures that LIS professionals can adapt to and anticipate the evolving needs of their communities. In addition to information literacy, technological proficiency has become indispensable in the digital age. LIS professionals are increasingly required to develop expertise in areas such as web development, database management, and digital content creation. These skills empower them to leverage digital tools and platforms to innovate and enhance service delivery, driving both efficiency and user satisfaction in library operations. As libraries transform into dynamic hubs of knowledge, these competencies form the backbone of professional adaptability and entrepreneurial innovation.

Effective communication and collaboration skills are paramount for engaging stakeholders and fostering partnerships in entrepreneurial endeavors (Armstrong & Collins, 2018). Librarians need networking, public speaking, and team collaboration skills to exchange ideas, build relationships, and co-create innovative solutions. Additionally, creativity and problem-solving skills play a crucial role in developing user-centered services and programs (necessary (Adebayo & Kolawale, 2023). LIS professionals with strong creative abilities can design innovative

solutions, prototype new services, and adapt to changing user needs. Understanding business principles and financial management is imperative for LIS professionals engaging in entrepreneurial activities. Proficiency in budgeting, financial planning, and project management enables librarians to develop sustainable business models, secure funding, and allocate resources effectively. Furthermore, cultivating an entrepreneurial mindset is essential for identifying opportunities, embracing ambiguity, and driving positive change (Ibrahim, 2024). An entrepreneurial mindset empowers LIS professionals to seize opportunities, adapt to change, and foster innovation within their organizations and communities.

To this end, the review has shed light on the diverse array of entrepreneurship education skills available within the field of Library and Information Science. From information literacy and technology proficiency to communication and collaboration, creativity and problem-solving, business and financial literacy, and entrepreneurial mindset, these skills are indispensable for driving innovation and creating value in libraries and beyond. As libraries continue to evolve into entrepreneurial spaces, investing in entrepreneurship education will be crucial for equipping LIS professionals with the skills and mindset needed to thrive in the digital age.

Furthermore, entrepreneurship Education has become increasingly recognized as a key component of academic programs in Library and Information Science (LIS). Understanding the perceptions of postgraduate students within the Department of Library and Information Science regarding the relevance of Entrepreneurship Education is essential for shaping future professionals and preparing them for diverse career paths. Entrepreneurship Education encompasses a broad array of knowledge and skills essential for fostering innovation, adaptability, and resourcefulness among individuals ((Adebayo & Kolawale, 2023). Within LIS, this education holds promise in equipping students with the entrepreneurial mindset necessary to navigate changing information landscapes, leverage emerging technologies, and create value within diverse information environments.

Numerous studies have explored the perceptions of postgraduate students towards Entrepreneurship Education in LIS programs. For instance, research conducted by Joseph and Adewunmi (2020) enquired into the attitudes and motivations of postgraduate students towards Entrepreneurship Education. Their findings highlighted a growing recognition among students of the relevance of entrepreneurial skills in augmenting traditional library roles and fostering innovation in information services.

Furthermore, investigations by Aina and Olufemi (2024) shed light on the perceived benefits of Entrepreneurship Education among postgraduate students in LIS. Their study revealed that students viewed Entrepreneurship Education as instrumental in enhancing their career prospects, equipping them with the skills to adapt to evolving professional landscapes, and empowering them to explore diverse career opportunities within and beyond traditional library settings. To this end, understanding the perceptions of postgraduate students regarding the relevance of entrepreneurship education in LIS is crucial for informing curriculum development and fostering a culture of innovation within the field. While there is growing recognition of its importance, overcoming institutional barriers and addressing resource constraints are essential for fully integrating entrepreneurship education into LIS programs. Skills acquisition among postgraduate students in the Department of Library and Information Science is influenced by a myriad of factors

spanning individual motivation, learning environment, curriculum design, peer interaction, personal background, and institutional support.

Methodology

The research adopted the quantitative approach and survey research design. The population consists of 246 postgraduate students of the Department of Library and Information Science at Ahmadu Bello University, Zaria, Nigeria, employing total enumeration sampling as the sample size. Self- developed questionnaire was used as the instrument for data collection. Total of two hundred and forty-six (246) copies of the questionnaire were distributed to respondents (postgraduate students) of the Department of Library and Information Science at Ahmadu Bello University, Zaria, Nigeria, via WhatsApp platforms. Out of these, two hundred and one (201) copies were completed, returned, and deemed suitable for analysis, resulting in a response rate of approximately 81.7%. Analysis of the collected data involves utilizing frequency distribution and percentages. A benchmark of 50% and above was regarded positive and accepted, while items with less than 50% was regarded negative.

Result and discussions

Types of Entrepreneurship Education Skills Available in the Field of Library and Information Science, Ahmadu Bello University Zaria

The types of entrepreneurship education skills available in the field of Library and Information Science in Ahmadu Bello University Zaria is presented in Table 1.

Table1 Entrepreneurship Education Skills Available in the Field of Library and Information Science, Ahmadu Bello University, Zaria

S/N	Types of entrepreneurship education skills	Frequency	Percentage (%)
1	Information organization and retrieval	198	98.51
2	Collection development and management	174	86.57
3	Cataloguing and classification	143	71.14
4	Database design and management	167	83.08
5	Metadata creation and management	173	86.07
6	Digital preservation	132	65.67
7	User experience design	98	48.76
8	Social-Media and Public Engagement Policy	78	38.81

The Table 1 presents the types of entrepreneurship education skills available in the field of Library and Information Science at Ahmadu Bello University, Zaria.. Information organization and retrieval ranked highest with 98.51%, followed by Collection development and management (86.57%), Metadata creation and management (86.07%), and Database design and management (83.08%). Other skills above the 50% mark included Cataloguing and classification (71.14%) and Digital preservation (65.67%), indicating that most respondents possessed these competencies to a considerable extent. On the other hand, only two entrepreneurship education skills recorded availability levels below 50%. These were User experience design with 48.76% and Social-Media and Public Engagement Policy with 38.81%.

The finding reveals that information organization and retrieval are the most prevalent entrepreneurship education skills in the field of Library and Information Science. This contrasts with the study conducted by Abdullahi et al (2021), which identified business planning, financial

management, and innovation management as integrated components of the curriculum in library and information science. The implications of these findings are significant for curriculum development, professional training, and service innovation. Strengthening underrepresented skills such as user experience design and social media engagement will not only expand the service portfolio of LIS professionals but also improve their adaptability to digital trends and user behavior patterns. Furthermore, maintaining and updating core competencies ensures that graduates remain competitive in both traditional and emerging information service markets.

Perception of Postgraduate Students in the Department of Library and Information Science at Ahmadu Bello University, Zaria Regarding Relevance of Entrepreneurship Education in the Field

The response of postgraduate students in the Department of Library and Information Science at Ahmadu Bello University with regards to relevance of Entrepreneurship Education in their field is presented in Table 2

Table 2: Perception of Postgraduate Students on the Relevance of Entrepreneurship Education in the Field of Library and Information science

S/No	Perception on relevance of entrepreneurship	SD (Freq/%)	D (Freq/%)	N (Freq/%)	A (Freq/%)	SA (Freq/%)	M
1	Intellectual ability & experience	20	22	33	40	86	3.75
2	Adequate knowledge & skills	100	40	10	30	21	2.16
3	Developing managerial competences	85	75	20	11	10	1.94
4	Assistance in small scale management	45	35	20	50	51	3.13
5	Critical and logical thinking	37	33	20	60	41	3.02
6	Enough managerial skills	21	44	25	55	56	3.40
7	Effective running of small enterprises	40	61	35	35	30	2.77
8	Coping with complexities in business	64	47	20	40	30	2.63

The findings revealed that postgraduate students perceived several aspects of entrepreneurship education in Library and Information Science positively, with mean scores of 3.00 and above. These include the view that entrepreneurship education has given students great intellectual ability and experiences to manage small-scale business enterprises (M = 3.75), assisted students in small-scale management, retraining employees, and preparing for their futures (M = 3.13), developed in students the ability to think critically and logically about business problems (M = 3.02), and provided students with enough managerial skills in managing small-scale business enterprises (M = 3.40). Conversely, other aspects of entrepreneurship education recorded mean scores below 3.00, indicating a more neutral or less favorable perception among respondents. These include the provision of adequate knowledge and skills towards the development and management of small-scale enterprises (M = 2.16), the role of entrepreneurship education in developing managerial competences (M = 1.94), the contribution of entrepreneurship programs to the effective running of small-scale enterprises (M = 2.77), and their role in helping students cope with complexities in the business world (M = 2.63).

The findings indicate that postgraduate students generally recognize the importance of entrepreneurship education in the field of Library and Information Science, particularly in areas related to intellectual capacity building, managerial skills, and critical thinking. Skills such as the ability to manage small-scale enterprises, retrain employees, prepare for future career paths, and think critically about business problems were perceived positively. This aligns with Adebayo and Kolawale (2023) research, which indicated that many students acknowledged the significance of entrepreneurship education in enhancing their professional skills and creating diverse opportunities beyond traditional career paths. The strong perception of these benefits suggests that entrepreneurship education is contributing to the preparation of graduates who can function effectively in both formal employment and self-employment contexts.

On the other hand, the study revealed that certain aspects of entrepreneurship education such as the development of managerial competences, the provision of adequate knowledge and skills for enterprise management, the effective running of small-scale businesses, and coping with the complexities of the business world were perceived less favorably. The implications are significant for curriculum designers and policy makers, as there is a need to strengthen experiential learning components, foster partnerships with industry, and integrate practical business simulations. Such improvements would bridge the gap between theoretical understanding and the practical demands of managing and sustaining small-scale enterprises, thereby ensuring that graduates are better equipped to navigate complex business environments.

Factors that influence skills acquisition among postgraduate students in the Department of Library and information Science at Ahmadu Bello University Zaria

Table 3 Factors Influence Skills Acquisition among Postgraduate Students in the Department of Library and Information Science at Ahmadu Bello University, Zaria

Factors influencing skills acquisition	Frequency	Percentage
1. Curriculum design and content	189	94.03
2. Faculty expertise and mentorship	182	90.55
3. Research opportunities	153	76.12
4. Professional development activities	155	77.11
5. Technological resources	144	71.64
6. Industry partnerships and internships	164	81.59
7. Supportive learning environment	164	81.59
8. Individual motivation and initiative	165	82.09

Table 3 presented the factors influencing skills acquisition among postgraduate students in the Department of Library and Information Science at Ahmadu Bello University, Zaria. The findings revealed that all the identified factors influencing skills acquisition among postgraduate students in the Department of Library and Information Science at Ahmadu Bello University, Zaria, were rated highly, with percentages above 50%. Curriculum design and content ranked highest at 94.03%, followed by Faculty expertise and mentorship (90.55%), Individual motivation and initiative (82.09%), Industry partnerships and internships and Supportive learning environment (both 81.59%). Other factors above the 50% mark included Professional development activities (77.11%), Research opportunities (76.12%), and Technological resources (71.64%).

The findings revealed that curriculum design and content were perceived by postgraduate students as the most influential factor in skills acquisition within the Department of Library and Information Science

at Ahmadu Bello University, Zaria, which aligns with the study conducted by Neck amd Greene (2011) who postulated that a combination of relevant course content, effective teaching methods, access to resources, and practical experience significantly influence skills acquisition among postgraduate students in LIS programs The implication of these findings is the need for educational institutions to prioritize enhancing curriculum design and content, along with other influential factors like faculty expertise, research opportunities, and technological resources, to effectively promote skills acquisition among postgraduate students in Library and Information Science programs.

Conclusion and Recommendations

The following conclusion and recommendations were made:

In conclusion, this study has provided valuable insights into the perceptions of postgraduate students regarding entrepreneurship education within the field of Library and Information Science. The findings underscore the significance of entrepreneurship education in equipping postgraduate students with the skills and mindset necessary to thrive in diverse information environments and explore alternative career pathways within the profession.

Based on the findings, it is recommended that the curriculum be enhanced to focus on practical entrepreneurial skill development, including business planning, marketing strategies, and financial management, alongside experiential learning opportunities such as internships and entrepreneurship competitions. Research opportunities should be strengthened through increased funding, institutional collaborations, and the organization of seminars and workshops on research methodology to encourage active student participation. Additionally, the entrepreneurship education curriculum should incorporate training modules on social media management and public engagement policies, supported by partnerships with industry experts, to equip students with the digital communication skills necessary for professional growth and relevance.

References

Abdullahi, J., Barkindo, A., & Chioma, E. A. (2021). Entrepreneurship Education in Library and Information Science: Fostering Economic Growth and Development in Nigeria. LibraryPhilosophy and Practice. Retrieved from DigitalCommons@University of Nebraska Lincoln

Adebayo, T., & Kolawale, I. (2023). Resource Utilization and Economic Diversification in Nigeria: Policy Perspective. Journal of African Development Studies, 12(3), 45-59.

Aina, O., & Olufemi, B. (2024). Challenges of Higher Education in Nigeria: Towards a Curriculum Reorientation. Educational Review and Policy Analysis, 18(1), 20-35.

Barkindo, A., Chioma, E. A., & Abdullahi, J. (2021). Challenges and Opportunities in LIS Entrepreneurship Education. Library and Information Science Journal, 34(2), 45-60.

Ibrahim, N. (2024). "Harnessing the Opportunities Identification In Library And Information Science For Entrepreneurial Creation And Growth In Nigeria." Fugus International Journal Of Library And Information Science 1.1 (2024): 95-103. DOI: https://doi.org/10.57233/fijlis.v1i1.10

Joseph, O., & Adewunmi, A. (2020). Impact of entrepreneurship education on the Development of small and medium enterprise in Nigeria. https://urn.fi/URN:NBN:fi:amk- 2024060320261

Neck, H. M., & Greene, P. G. (2011). Entrepreneurship education: Known worlds and new frontiers. Journal of Small Business Management, 49(1), 55-70.

Olanrewaju, M. (2024). The Impact of Entrepreneurship Education on Improving Small and Medium-size Enterprises (SMEs) Performance in Kwara and Oyo States, Nigeria.

Usman, A. N., & Ajibola, T. S. (2023). Enhancing Employment Opportunities Of Graduates Of Library And Information Studies Through Entrepreneurship Education In Two Universities In Niger State. Middlebelt Journal Of Library And Information Science, 21, 115-125.

USER'S PERCEPTION ON THE ADOPTION OF INTERNET BANKING SERVICES: A CASE STUDY OF BANK CUSTOMERS IN IBADAN METROPOLIS, NIGERIA.

Olomola, Oludolapo (PhD);
Lead City University Ibadan, Oyo State.

Tunmibi, Sunday (PhD);
Lead City University Ibadan, Oyo State.

Abstract

This study investigated the user's perception on the Adoption of Internet Banking Services: a case study of Bank Customers in Ibadan Metropolis, Nigeria. A descriptive survey design was adopted, using a convenience sampling method, and the study was conducted across the five local government areas in the metropolis. Data were collected through a questionnaire (including an open-ended question), with 250 copies administered and 206 retrieved, resulting in an 82.4% response rate. The analysis was conducted using descriptive statistics, Pearson correlation, linear regression, and multiple regression. The findings revealed that perceived usefulness had a significant relationship with Internet banking usage, while perceived ease of use did not. Most respondents were active users of Internet banking and possessed intermediate IT literacy, which influenced their usage. The study concluded that perceived usefulness is a major determinant of Internet banking adoption in the area. It is recommended that banks regularly inform users about new platform features and train staff to promptly address customer complaints to further encourage adoption among potential users.

Keywords: Adoption, Bank customer, Internet banking use, Ibadan metropolis, Perceived Usefulness, Perceived ease of Use, Users Perception

Introduction

Electronic banking, also called e-banking covers a wide range of electronic activities which includes tele-banking, mobile banking, ATM (Automated Teller Machine) and online banking. In order to enhance service delivery and expand customer reach, modern financial institutions have increasingly adopted digital channels such as internet, online and mobile banking, leveraging interconnected networks and platforms to offer real-time, user-centered banking services. *(*Olowookere & Okafor, 2023). Online banking enables financial transactions "through the use of World Wide Web wherever Internet is available, at anytime, anywhere" and its perceived usefulness is a strong determinant of customer intention to adopt the service The Internet, first introduced in 1960, became widely accessible by 1990s, then the text-based pages of the 1990s to today's multimedia rich pages (Agarwal et al. 2022). Originally developed for academic and defense purposes, the internet has since transformed into a global infrastructure that revolutionizes communication, commerce, and societal interaction but overtime evolved into a great agent of change in many facets of life among which is business and commercial activities (Adegbite, & Nwokoro, 2022). With the rise of internet infrastructure and their use to perform banking operations which is defined as internet banking. Nigerian banks now deliver services through digital platforms, allowing seamless transactions and real-time account access (Ogunleye & Ojo,2022).

As against the traditional banking system, the advantages of Internet banking are numerous and obvious. Internet banking have significantly transformed Nigeria's financial service landscape, offering customers

flexible access to banking transactions beyond traditional branch networks Oladeji, & Ajayi. (2022).With the advent of the Internet, banking in the cyberspace is fast and rapidly becoming the accepted alternate means for performing banking transactions. Online banking, also referred to as Internet banking, is an electronic payment system that enables customers to access most of their banking transactions using a safe website, which is operated by their respective banks. Banks in Nigeria have expanded their service delivery by integrating web-based platforms that enable customers to perform a range of financial transactions that includes: transfer funds, pay bills, and check balances in real-time and more (Adeyemi & Bakare, 2022). Online banking involves a range of transactions that includes making balance enquiry, printing statement of accounts, checking the status of account, booking for tickets and hotel reservation, paying for goods and services, school fees payment, bill settlement, stopping missing or stolen cheque leaves, making general enquiry, tracking ATM (Automated Teller Machine) card location, amongst many other transactions. Customers still have access to carry out core transactions like in the traditional banking system without driving down or visiting a physical branch of the bank, which means transactions can be done at the comfort of their rooms.

Bank customers today are not only interested about the safety of their funds and increase returns on their investment but now customers demand efficient, fast, timely, personalised and convenient services. There is a growing demand among Nigerian bank customers for tailored services that align with their personal lifestyles and business ventures, prompting banks to adopt more customer-centric models (Eze & Ogunbanjo, 2022). Online banking offers another level of convenience for performing bank transaction and managing finances. With Internet banking, banks will also be able to reduce their paper work (no filled tellers, transfer instructions, request for transaction details, no need to photocopy instruments and identity cards) as all these would have been done by customers online. Banks will have better queue management in the banking hall, reduce administrative cost of buying stationeries, purchasing and servicing equipment and improvement in the quality of service. The adoption of internet banking platforms in Nigeria has led to real-time information flow between banks and their customers, transforming how financial services are accessed and delivered(Akinlade & Okonkwo, 2022). Internet banking has reduced administrative cost, transaction processing time and amount of manual paper work. Internet banking has also improved quality of service which in turn provided a conducive working environment and increased staff loyalty.

In Nigeria, the adoption of online banking continues to face a range of barriers, including unstable electricity, digital illiteracy, and inadequate ICT infrastructure, all of which continue to reduce user trust and hinder the widespread acceptance and usage of e-banking services in Nigeria (Okonkwo & Yusuf, 2023). Part of the reasons identified by Okonkwo & Alabi, (2022) and also supported by Mensah & Ochieng,(2021) why Internet banking was having a moderate economic impact in Nigeria includes limited awareness, infrastructure gaps, trust in the system, a lack of adequate operational infrastructure like proper telecommunications and power. In addition to cybercrimes which is creating fear in people. It is therefore very important to investigate further and understand the issues bank customers face in the use of online banking services. The present study aims at investigating and understanding the factors that determine the use of online banking services amongst bank customers in Ibadan metropolis. The objective is to fill a gap in existing literature by focusing on the users of Internet banking services among bank customers in Ibadan metropolis adopting variables (perceived ease of use and perceived usefulness) from the Technology Acceptance Model.

Perceived ease of use refers to the degree to which a consumer or user believes that adopting the technology is straightforward, requires minimal effort and mental strain, in addition, is simple to understand (Akinwale & Eze , 2022*).* Perceived ease of use is more salient in the pre-adoption stage of

the innovation adoption. The reason is that perceived ease of use significantly determines user willingness to engage, especially when apprehensions about complexity and digital literacy are present *(*Adewale & Chukwuemeka, 2022). Thus, customers are more likely to accept the Internet banking services if there is ease of use in its operations and processes which can be instrumental to the utilization of technology and contribute to individual benefit, seeing it as a psychological enabler that improves work performance and reduces cost and complexity (Lee & Schumann, 2021).Davis (1989) defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". The importance and customer's perception of the usefulness of internet banking services plays a critical role in determining adoption levels, particularly when benefits like speed, convenience, and financial control are evident. (Okafor & Bamidele, 2022). People use online banking services because they find that using banking web sites enhances the productivity of their banking activities and that they are useful for performing financial transactions. The greater the perceived usefulness of using online banking services, the more likely that online banking will be accepted by users, The more useful the customers perceive online banking services to be particularly in managing time and simplifying transactions the more likely they are to adopt such platforms (Bello & Yusuf, 2021; Awoniyi,2022).

In the context of internet banking, perceived usefulness continues to be a primary factor influencing user adoption, particularly when the platform significantly enhances task performance and banking convenience (Wong & Hwang, 2021).Proper understanding of these variables could enable banks to improve online banking services use among bank customers in Ibadan, with the goal of increasing and retaining bank customers' users of online banking platforms. Hence, this study intends to contribute to the body of knowledge by focusing on perceived ease of use and perceived usefulness of internet banking platforms adopted by users in Ibadan metropolis, Oyo State, Nigeria. The aim of this study is to determine the influence of these variables on use of internet banking services among bank customers in Ibadan metropolis. The specific objectives are to assess bank customers' perceptions on use of internet banking services in Ibadan metropolis; identify the level of perceived usefulness of internet banking platforms adopted by bank customers in Ibadan metropolis; and identify the level of perceived ease of use of internet banking platforms adopted by bank customers in Ibadan metropolis.

Statement of Problem

Despite the numerous benefits of internet banking for customers, financial institutions, and the economy, adoption of internet banking services and consistent usage remains suboptimal due to some factors in Nigeria. Some users still struggle with system complexity, low digital literacy, and infrastructure limitations. These challenges hinder their willingness to adopt and consistently use online banking services (Aduba, 2021). Existing studies have largely focused on trust, convenience and infrastructure not on account for broader, real-world user experience variables (Oyekunle et al. ,2024; Isiaku, Muhammad, Oluwajana, & Kwala, 2022; Sharma et. al., 2024). In particular, few studies have explored the perceptions of active users in urban areas like Ibadan. This study therefore, addresses that gap by focusing on current users across multiple banking platforms in Ibadan metropolis to provide a more comprehensive understanding of online banking services among users in Ibadan Metropolis.

Research Questions; the study answers the following questions

1. What is the level of use of internet banking services among bank customers in Ibadan?
2. How do bank customers assess the level of perceived usefulness of Internet banking?
3. What is the level of perceived ease of use of Internet banking among bank customers in Ibadan?

The following hypotheses were tested:
H_o1: There is no significant relationship between perceived ease of use and use of Internet banking services among bank customers in Ibadan metropolis.
H_o2: There is no significant relationship between perceived usefulness and use of Internet banking services among bank customers in Ibadan metropolis.

Literature Review

Technology Acceptance Model (TAM) and Internet Banking Adoption in Nigeria

The Technology Acceptance Model (TAM), originally developed by Davis (1989) as an extension of the Theory of Reasoned Action (TRA) by Ajzen & Fishbein (1980), is widely recognized as one of the most influential frameworks for understanding user acceptance of information technology. TAM posits that two core beliefs perceived usefulness (PU) and perceived ease of use (PEOU) drive a user's attitude, intention to use, and actual system usage. In the Nigerian context, Awoniyi (2022**)** found that consumers adopt Internet banking primarily due to its convenience, time-saving nature, and ease of use compared to traditional banking. TAM has proven to be robust in predicting user behavior in IS/IT contexts, including online banking, where factors such as security and regulatory concerns also influence adoption (Abdullahi, Ward, & Ahmed, 2016; Lee, Kozar, & Larsen, 2021).
Perceived usefulness refers to the belief that using a system enhances job performance (Davis, 1989). For busy professionals, the flexibility of performing transactions anytime and anywhere exemplifies this benefit. Studies have shown a strong link between perceived usefulness and positive attitudes toward electronic banking (Isiaku et. al., 2024; Onugbeu et. al., 2025).
Perceived ease of use, on the other hand, refers to the system being free from effort (Davis, 1989). Findings by Tom & Krishnan (2021) and Usman et al. (2020) confirm that low complexity leads to stronger behavioral intentions. Further research by Adeyinka & Olasina (2022) supports the association between PEOU, user satisfaction, and actual usage.
Although some studies apply alternative theoretical models or descriptive approaches, TAM remains widely cited and relevant in studies from 1989 to the present (Onuegbu et al., 2025; Yusuf & Bala, 2021; Alsoud, Othman & Bin, 2018). It effectively explains how external variables impact internal beliefs and attitudes, shaping technology adoption behavior.

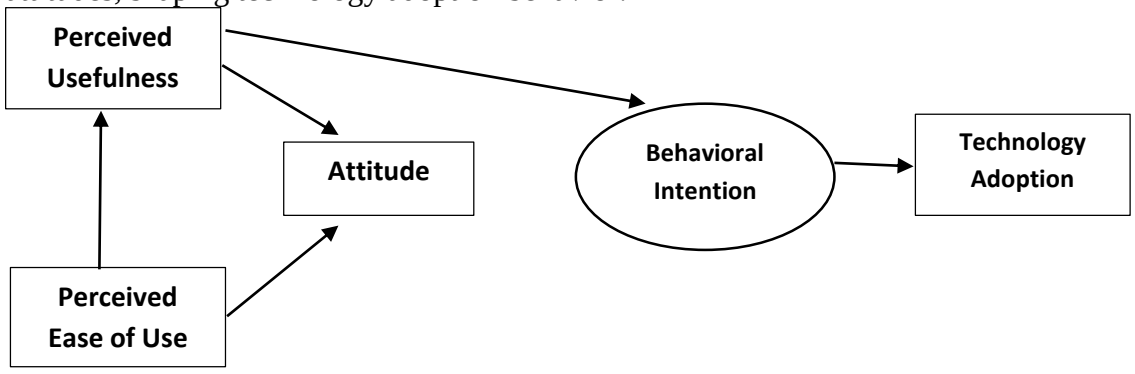


Fig 1: Technology Acceptance Model – TAM (Davis, 1989)

Over the years, research on Information Systems and technology adoption and use has changed in focus and methodology. Technology development particularly in the area of information technology is revolutionizing the way business is done. Nowadays, the Internet plays an important role in the financial

and banking services. Since Internet banking is a product of information system and technology innovation, it has revolutionized the banking industry all over the world. This revolution is as a result of the dynamic nature of information systems and technology that keeps improving because of competitive pressure in the industry. Several researchers have worked on studies focusing on the acceptance and use of Internet banking around the world. These studies have made use of different models, variables, population and geographical locations but there were some limitations and inadequacies. Based on the gaps not filled by these previous studies, it is important to have empirical studies on antecedents of Internet banking service adoption to thoroughly assess the extent of work done or work not done by earlier researchers. Below are some of these studies reviewed.

Lee and Schumann (2021) explored the relevance of ease of use and early engagement in users' adoption of digital technologies, including Internet banking. Their study, which examined psychological and usability factors, found that users are more likely to adopt and sustain use when platforms are intuitive and reduce cognitive load. Early user engagement especially through onboarding experiences and interactive features was identified as a significant predictor of adoption, suggesting that initial user experience plays a pivotal role in shaping long-term usage behavior. Akinwale and Eze (2022**)** examined user perceptions and e-banking adoption in Nigeria, identifying key determinants such as security, user interface design, and convenience. Their findings indicated that while many users appreciate the flexibility of digital banking, poor user interface and concerns about unauthorized transactions hinder full adoption. The study emphasized the need for banks to invest in user education and improved app usability to foster greater trust and long-term usage.

Oyekunle, Okorie, and Salami (2024) applied usability testing methods to reveal that interface design flaws, poor navigation, and lack of personalization continue to hinder user satisfaction. Despite users recognizing the convenience of mobile banking, the study found that poor user experience undermines perceived value**,** especially for routine banking activities. This research is significant because it highlights that technical adoption does not automatically translate to positive user experience**,** reinforcing the idea that digital banking platforms must be developed with user-centered design principles to ensure long-term engagement. Adebayo and Nwachukwu (2023) focused on the economic influence of Internet banking in Nigeria and its impact on user adoption. The study found that perceived economic benefits such as lower transaction costs, time savings, and access to credit motivated users to adopt Internet banking services. However, gaps in digital infrastructure and inconsistent service delivery created barriers. The authors suggested that highlighting the tangible financial gains of e-banking could drive wider user engagement.

Mensah and Ochieng (2021) assessed digital banking adoption in Africa amidst the rise of fintech platforms. Their findings showed that while fintech has expanded access, traditional barriers such as lack of trust, digital exclusion, and language limitations still affect adoption in rural and semi-urban areas. The study proposed hybrid models combining human touchpoints with digital tools as a strategy to build user confidence and bridge cultural and technological gaps in adoption. Oladipo and Ezeani (2022) explored the digital divide and how it affects Internet banking adoption in Nigeria's emerging markets. Their research showed that age, income level, and education strongly influence adoption, with younger and more educated users adopting more quickly. The study recommended targeted digital inclusion strategies, especially for older adults and underserved communities, to expand access and promote financial inclusion.Zhou and Rajan (2021) examined how Internet banking impacts both organizational performance and customer experience. From the user perspective, the study highlighted that seamless navigation, personalization, and instant support significantly enhance satisfaction and drive adoption. Users valued platforms that offered

not only transactional services but also financial planning tools. The study emphasized the role of user feedback loops in continuously refining the digital banking experience.

Methodology

This study adopted a descriptive survey methodology**,** which is suitable for gathering information on the opinions, attitudes, and behaviours of individuals within a specific population. A descriptive survey design was employed due to its cost-effectiveness and its appropriateness for capturing data from a large group using structured questionnaires. The population of the study comprised bank customers in Ibadan metropolis, Oyo State, Nigeria—a major commercial center in southwestern Nigeria with eleven local government areas, including five urban and six semi-urban LGAs. The sample consisted of 250 internet banking users selected using a convenience sampling technique from five urban LGAs Ibadan North, Ibadan East, Ibadan North West, Ibadan South East, and Ibadan South West where commercial banks are most concentrated. The research instrument used was a structured questionnaire based on the Technology Acceptance Model (TAM), utilizing a 4-point modified Likert scale to measure perceived ease of use and perceived usefulness. The questionnaire items were validated by experts in the field**,** and reliability was ensured through expert review. Data collection was carried out along with two trained research assistants to administer the questionnaires in bank branches across the selected LGAs. Ethical considerations were strictly observed: participants were informed about the purpose of the study, confidentiality was maintained, and intellectual property rights were respected. The collected data were analyzed using appropriate statistical tools to examine the relationship between users' perceptions and internet banking usage. Information collected from respondents was also made confidential. In addition, sourced materials and intellectual properties were appropriately cited and credit duly accorded. Fabrication of data was equally guided against.

Result and Discussion

This section presents the findings of the study and interprets in relation to the research objectives.

Research Question 1: What is the level of use of internet banking services among bank customers in Ibadan?

The results of the perceptions of the Internet banking users to the item used to measure use of Internet banking is presented in Table 1.

Table 1: Descriptive Statistics for Use of Internet Banking

Use of Internet banking						
Items	**SA (%)**	**A (%)**	**D (%)**	**SD (%)**	**Mean**	**Std Dev.**
Internet banking use helps me to manage my finances easily and effectively.	29 (14.1%)	124 (60.2%)	45 (21.8%)	8 (3.9%)	2.84	0.702
I use Internet banking to carry out my banking transactions.	40 (19.4)	95 (46.1)	64 (31.1)	7 (3.4)	2.82	0.781
I use Internet banking everyday	42 (20.4%)	68 (33%)	87 (42.2%)	9 (4.4%)	2.69	0.843
I cannot carryout banking transactions successfully without using Internet banking	17 (8.3%)	72 (35%)	101 (49.0%)	16 (7.8%)	2.44	0.754

Results presented in Table 1 shows that 14.1% of the respondents strongly agreed that Internet banking helped them manage their finances easily and effectively. Also, 60.2. % agreed to this claim, while 25.7% did not agree that Internet banking helped them manage their finances easily and effectively. Almost 8.3% of the respondents also strongly agreed that they can only carry out transactions successfully using Internet banking, 35% also agreed while 56.8% did not agree that Internet banking is the only means to carry out successful transactions. The mean results shows that respondents that only Internet banking can be used to carry out successful transactions had the lowest mean ($\bar{x}$=2.44, SD=0.754), while the item that states that Internet banking helped manage funds easily and effectively had highest mean response ($\bar{x}$=2.84, SD=0.702). This implies that users find internet banking useful in managing their finances easily and effectively.

The results of the perceptions of the Internet banking users to each item used to measure perceived usefulness is presented in Table 2.

Table 2: Descriptive Analysis for Perceived Usefulness

Research Question 2: How do bank customers assess the level of perceived usefulness of Internet banking?

Perceived usefulness						
Items	**SA (%)**	**A(%)**	**D(%)**	**SD(%)**	**Mean**	**Std Dev.**
Internet banking makes it easier for me to do my banking activities.	114 (55.3)	85 (41.3)	5 (2.4)	2 (1.0)	3.51	0.599
Using Internet banking platform saves my time and cost too.	97 (47.1)	101 (49.0)	4 (1.9)	4 (1.9)	3.41	0.632
Internet banking enables me to complete my banking activities more quickly.	77 (37.4)	119 (57.8)	8 (3.9)	2 (1.0)	3.32	0.595
I can easily perform almost all banking transaction on Internet banking platform.	75 (36.4)	107 (51.9)	22 (10.7)	2 (1.0)	3.24	0.675
Internet banking enables me to complete my banking transactions activities more conveniently.	66 (32.0)	126 (61.2)	12 (5.8)	2 (1.0)	3.24	0.600
Internet banking enables me to complete my banking transactions activities more efficiently.	55 (26.7)	124 (60.2)	26 (12.6)	1 (0.5)	3.13	0.63
I find all the features on Internet banking useful and relevant to my banking needs.	57 (27.7)	98 (47.6)	50 (24.3)	1 (0.5)	3.02	0.735

Results presented in Table 2 revealed that a total percentage of 55.3% of respondents strongly agreed that Internet banking made it easier for them to perform their banking activities, while 1.0% of the respondents disagreed. Also, 60.2% agreed that Internet banking enabled them complete banking transactions efficiently while, 0.5% disagreed to the fact that Internet banking enabled them complete banking transactions efficiently. Almost 48% of the respondents agreed that they found all the features on Internet banking platform useful and relevant, 27.7% strongly agreed that all these features were relevant, while 24.3% disagreed that all the features were relevant and useful. The mean results for users who found all features on Internet banking platform relevant and useful is the lowest mean response ($\bar{x}$=3.02, SD=0.735), while results of users who agreed that use of Internet banking makes banking transactions easier to perform is

the highest mean response ($\bar{x}$=3.51, SD=0.599). From the mean and standard deviation figure, it can be concluded that all of the mean scores reported were towards agree and strongly agree opinions, indicating that in general items perceived usefulness is viewed as important by the respondents. The positive perceptions of transaction speed, ease of access, and operational convenience are likely to translate into greater acceptance and sustained usage of internet banking platforms among customers in Ibadan. The result implies that certain features on the platform may not be too clear in terms of user interface design, or awareness, indicating a need for banks to review design, clarity and communication of platform functionalities.

Research Question 3: What is the level of perceived ease of use of Internet banking among bank customers in Ibadan?

The results of the perceptions of the Internet banking users to each item used to measure perceived ease of use is presented in Table 3.

Table 3: Descriptive Statistics for Perceived Ease of Use

Perceived ease of use						
Items	**SA(%)**	**A(%)**	**D(%)**	**SD(%)**	**Mean**	**Std Dev.**
Internet banking is an easy way to conduct banking transactions.	91 (44.2)	102 (49.5)	9 (4.4)	4 (1.9)	3.36	0.660
Overall, I find Internet banking easy to use.	83 (40.3)	113 (54.9)	8 (3.9)	2 (1.0)	3.34	0.603
Internet banking platform is content friendly and easy to understand.	66 (32.0)	117 (56.8)	20 (9.7)	3 (1.5)	3.19	0.663
It is easy to become skilful using the Internet banking platform.	40 (19.4)	148 (71.8)	15 (7.3)	3 (1.5)	3.09	0.564
Using Internet banking requires little mental effort.	46 (22.3)	121 (58.7)	33 (16.0)	6 (2.9)	3.00	0.709

Results presented in Table 3 revealed that a total percentage of 44.2% of respondents strongly agreed that Internet banking is an easy way to perform their banking activities, 49.5% agreed that Internet banking is an easy way to perform their banking transactions, while 1.9% of the respondents disagreed that Internet banking is an easy way to conduct their banking transactions. Also, 22.3% strongly agreed that Internet banking required little mental effort, 58.7% agreed to that fact that Internet banking required little mental effort however, 18.9% of the respondents did not agree that Internet banking requires little mental effort. The mean results for users who found all features on Internet banking platform relevant and useful is the lowest mean response ($\bar{x}$=3.00, SD=0.709), while users who agreed that use of Internet banking made banking transactions easier to perform is highest mean response ($\bar{x}$=3.36, SD=0.660). This finding may reflect moderate level of perceived ease of use**,** as the majority of respondents view the platform as easy to use and requiring minimal mental effort. It might also be due to the fact that most of the respondent are students and professionals, hence IT literacy level is relatively high judging from their level of education.

Test of Hypotheses

Bivariate Correlation analysis was performed. The "Pearson's R" represents the correlation coefficient between the variables tested and the "Significant value" gives an indication on whether the relationship "linkage" established between the variables is significant or not. The pre-set level of significance tests of all hypotheses in this study is 0.05. Null hypothesis (denoted by H_0) would assume that

no relationship exists between the two dependent and independent variables. If p-value (significance of the test exceeds the pre-set level of significance (0.05), the null hypotheses will be accepted, but if p-value is lesser than or equal to 0.05, null hypotheses is rejected.

Hypothesis 1

Hypothesis 1 indicates the relationship between perceived ease of use and Internet banking use among bank customers in Ibadan metropolis.

H_o1: There is no significant relationship between perceived ease of use and use of Internet banking services among bank customers in Ibadan metropolis.

Table 4 presents the results of the regression analysis between perceived ease of use and Internet banking use among bank customers in Ibadan.

Table 4(a): Regression Analysis between Perceived Ease of Use and Internet Banking use

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant (use of Internet banking services)	9.036	1.124		8.042	0.000
Perceived Ease of Use	0.110	0.069	0.110	1.579	0.116

Results provided in Table 4a display R, correlation coefficient of the relationship between Internet banking use and perceived ease of use to be 0.110. This indicates that relationship observed is highly significant, predictor variable is statistically reliable even if it does not explain much of the variance indicates the degree of relationship between perceived ease of use and Internet banking use.

Table 4b: Model Summary of Regression Analysis Test between Perceived Ease of Use and Internet Banking Use

Model	**R**	**R Square**	**Adjusted R Square**	**F**	**P value (sig)**	**Remark**
Regression	0.110[a]	0.012	0.007	2.494	0.116[b]	Not Significant

Results provided in Table 4b display the R^2 value which is 1.2% indicates the extent by which perceived ease of use will predict Internet banking use. The level of significance is 0.116, which is greater than 0.05 (Decision rule: reject H_o if $p< 0.05$). Therefore, the null hypothesis is accepted. Thus perceived ease of use did not determine use of Internet banking by bank customers in Ibadan metropolis. This may imply that bank customers' decisions to use internet banking are likely driven more by other factors than mere simplicity of using internet banking, in order words it may imply that ease of use is not enough to drive use of internet banking.

Hypothesis 2

Hypothesis 2 indicates the relationship between perceived usefulness and Internet banking use among bank customers in Ibadan metropolis. Linear regression was performed to know the statistical significance between the two variables.

H_o2: There is no significant relationship between perceived usefulness and use of Internet banking services among bank customers in Ibadan metropolis.

Table 5 presents the result of the correlation between Perceived usefulness and Internet banking use among bank customers in Ibadan.

Table 5a: Regression Analysis between Perceived Usefulness and Internet Banking use

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant (use of Internet banking services)	5.890	1.140		5.167	0.000
Perceived Usefulness	0.214	0.049	0.291	4.341	0.000

Results presented in Tables 5a reveal that the correlation coefficient of the relationship between perceived usefulness and Internet banking use is 0.291, this also indicates the strength of relationship between perceived usefulness and Internet banking use. suggesting that perceived usefulness has a statistically positive effect on internet banking use.

Table 5b: Model Summary of Regression Analysis Test between Perceived Usefulness and Internet Banking Use

Model	**R**	**R Square**	**Adjusted R Square**	**F**	**P value (sig)**	**Remark**
Regression	0.291	0.085	0.080	18.847	0.000^b	Significant

Results presented in Tables 5b shows that adjusted R^2 is 8.5%, this indicates the extent by which perceived usefulness determined Internet banking use, this explains 8.5% of the variance in internet banking use. The level of significance is 0.000, which is less than 0.05 (Decision rule: reject H_o if $p< 0.05$). Therefore, the null hypothesis is rejected, hence perceived usefulness determine the use of Internet banking by bank customers in Ibadan Metropolis. This implies that perceived usefulness is a key lever that banks can pull to increase digital engagement.

Discussion of Findings

The study reveals a weak, positive and non-statistically significant relationship between perceived ease of use and Internet banking use, no significant individual effect on internet banking use. These findings deviate from some empirical studies which have reported that perceived ease of use have significant relationship with Internet banking use. Studies such as Awoniyi, (2022) found out that perceived ease of use had significant and strong relationship with Internet banking use, In addition, Kaulu, Kaulu and Chilongo, (2024), also in his study on adoption of e- banking in Zambia among users found perceived ease of use to be the factor significant in e banking adoption. Olawepo & Akanbi (2019), in their study on Internet banking adoption in Technology Acceptance Model and found perceived ease of use to be significant to adoption of Internet banking in Nigeria. However, findings from Aboobucker & Bao (2019) supported the findings of this study, because perceived ease of use was not significant to Internet banking use, In addition according to Isiaku et al. (2024), perceived ease of use had little or no effect on internet banking use, perceived ease of use did not have a significant relationship with Internet banking use in this study which may be due to the fact that majority of the users are professionals and students, who love to explore online. In addition, most of these students and professionals are well exposed to the online environment, so using the platform might not be much of an effort to them.

This study found a significant positive relationship between Internet banking use and perceived usefulness, this claim is also supported by previous authors such as Makambe & Mmusi, 2020; Awoniyi, 2022). Findings from these studies found significant relationship between perceived usefulness and use of Internet banking services. Findings from Safari, Bisimwa & Armel (2022), also revealed that perceived usefulness had significant positive influence among students on the intention to adopt Internet banking in Pakistan. The results show that users believed that use of Internet banking (IB) services can save time and facilitates banking activities and transactions quickly in an easier way.

Conclusion and Recommendations

The study concludes that bank customers in Ibadan metropolis make use of Internet banking platform. The study also concludes that perceived usefulness is one of the factors that determine internet banking use among bank customers in Ibadan metropolis. However, there is no significant evidence to suggest that perceived ease of use is a determinant of use of internet banking platform, this idea indicates that ease is not always central to adoption and use. Improving ease of use alone may not be enough to drive internet banking use, banks need a multi-dimensional strategy**.** The study recommends that policies should be put in place to make internet banking services attractive to intending users, including a regular update of the features on the platform. This could encourage better use of the platform. In essence, perceived usefulness is a key lever that banks can pull to increase digital engagement, customer satisfaction and retention.

References:

Abdullahi, F., Ward, R. and Ahmed, E. (2016). Investigating the Influence of the Most Commonly Used External Variables of TAM on Students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolis. *Computers in Human Behaviour*, 63, 75-90

Aboobucker, I., & Bao, Y. (2019). What obstruct customer acceptance of internet banking? Security, trust, website usability and the role of moderators. *The Journal of High Technology Management Research, 29*(1), 109–123. https://doi.org/10.1016/j.hitech.2018.04.010

Adebayo O., & Nwachukwu, P. (2022). E-Banking and Operational Efficiency in Nigerian Banks: A Post-COVID Perspective. *Nigerian Journal of Financial Innovation,* 10(1), 40–55.

Adegbite, T. & Nwokoro, C. (2022). The Internet and Digital Economy in Africa: From Infrastructure to Impact. *African Journal of Information Systems,* 14(1), 22–35.

Adewale, M., & Chukwuemeka, E. (2022). Factors Influencing Pre-Adoption of Digital Banking Services in Nigeria. *Journal of ICT and Consumer Behavior in Africa, 6(1), 42–58.*

Adeyemi, S., & Bakare, T. (2022). The Role of Online Platforms in Enhancing Financial Services Delivery in Nigeria. *Journal of E-Banking and Financial Innovation*, 6(1), 41–58.

Adeyinka, T., & Olasina, G. (2022). The influence of perceived usefulness and perceived ease of use on the continuance intention to use electronic collection system in Nigerian hospitals: A conceptual approach. *International Journal of Education, Technology and Science, 2*(2), 164–180.

Aduba, J. J. (2021). On the determinants, gains and challenges of electronic banking adoption in Nigeria. *International Journal of Social Economics,* 48(7), 1021–1043. https://doi.org/10.1108/IJSE-07-2020-0452

Agarwal, R., Salehi-Sangari, E., & Lages, C. (2022). Factors influencing customers' intention to adopt internet banking: An integration of ISSM and UTAUT with price value and perceived risk. *Frontiers in Psychology***,** *13*, https://doi.org/10.3389/fpsyg.2022.919198

Ajzen, I., & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall

Akinlade, M., & Okonkwo, E. (2022). Real-Time Banking and Customer Interaction in Nigeria's Digital Economy. *African Journal of Digital Finance and Innovation,* 8(2), 28–44.

Akinwale, Y., & Eze, U. (2022). User Perceptions and the Adoption of E-Banking in Nigeria. West *African Journal of Digital Innovation,* 9(1), 55–70.

Alsoud, M. A., Othman, I. & Bin L. (2018). Factors influencing online shopping intention in Jordan: An empirical study based on the TAM model. *International Journal of Current Innovations in Advanced Research, 1*(6), 1–13

Awoniyi, O. (2022). Digital banking adoption in Nigeria: The place of Technology Acceptance Model. *Asian Journal of Economics, Business and Accounting, 22*(7), 59–72

Bello, A. A., & Yusuf, O. A. (2021). Adoption of e-banking services in Nigeria: A TAM-based empirical investigation. *Nigerian Journal of Banking and Finance, 15*(1), 35–50

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Eze, C., & Ogunbanjo, A. (2022). Personalized Banking in Nigeria: Enhancing Customer Experience through Tailored Services. *Nigerian Journal of Financial Services Innovation,* 7(1), 33–49.

Isiaku, L., Muhammad, A. S., Oluwajana, D., & Kwala, A. (2024). Making mobile financial services stick: An empirical investigation into user attitudes and intentions for sustainable adoption. *Journal of Innovative Digital Transformation,* Advance online publication. https://www.emerald.com/insight/content/doi/10.1108/JIDT-01-2024-0001/full/html

Kaulu, B., Kaulu, G., & Chilongo, P. (2024). Factors influencing customers' intention to adopt e-banking: A TAM and cybercrime perspective using structural equation modelling. *Journal of Money and Business,* 4(1), 38–53. https://doi.org/10.1108/JMB-01-2024-0007

Lee, J., & Schumann, D. (2021). Technology Adoption in the Digital Era: Revisiting Ease of Use and Early Engagement. *International Journal of Human-Technology Interaction, 11(2), 77–93*

Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2021). The technology acceptance model: Past, present, and future. *Communications of the Association for Information Systems*, 17(1), 50–87. https://doi.org/10.17705/1CAIS.01750

Makambe, U., & Mmusi, O. A. (2020). Perceived usefulness and internet banking adoption at a selected bank in the Kgalagadi District, Botswana. *The Information Technologist*, **17**(2), 97–112.

Mensah, J., & Ochieng, P. (2021). Digital Banking in Africa: Challenges of User Adoption in the Age of Fintech. *Journal of Emerging Market Technologies*, 9(1), 45–61.

Ogunleye, B., & Ojo, A. (2022). Digital banking transformation in Nigeria: Adoption, challenges, and impact. *Nigerian Journal of Banking and Finance*, 15(2), 50–64.

Okafor, C., & Bamidele, T. (2022*).* Evaluating the Role of Perceived Usefulness in the Adoption of E-Banking in Nigeria. *Nigerian Journal of Digital Finance, 8(2), 55–69.*

Okonkwo, C. J., & Yusuf, R. A. (2023). Barriers to E-Banking Adoption in Nigeria: A Review of Structural and User-Level Challenges. *African Journal of Information Systems and Technology*, 9(1), 21–39.

Okonkwo, E., & Alabi, S. (2022). Internet Banking in Nigeria: Barriers to Adoption and Economic Impact. *Nigerian Journal of Information Systems and Technology*, 11(2), 38–54.

Oladeji, T., & Ajayi, K. (2022). Adoption and Impact of Internet Banking in Nigeria's Financial Sector. *Journal of Information and Financial Innovation*, 9(1), 35–50.

Oladipo, T., & Ezeani, C. (2022). Bridging the Digital Gap: Internet Banking Adoption in Nigeria's Emerging Market. *Nigerian Journal of Digital Financial Services*, 7(2), 63–77.

Olawepo, G. T., & Akanbi, P. A. (2019). An examination of some selected factors influencing adoption of internet banking among undergraduate students in Oyo Town, Nigeria. *Research Journal of Finance and Accounting*, *10*(6), 59–68.

Olowookere, A. & Okafor, C. (2023). Digital Transformation in the Nigerian Banking Sector: Trends, Technologies, and Customer Experience. *Journal of Financial Technology and Innovation, 8(2), 45–58*

Onuegbu, O. C., Agbamu, B. O., Anyakoha, B. U., & Anunike, O. W. (2025). *Communication, awareness and acceptance of digital banking amidst cash crunch in Southeast and South-South Nigeria.* Retrieved from https://arxiv.org/abs/2504.10546

Oyekunle, M., Okorie, F., & Salami, T. (2024). Usability evaluation of Nigerian banks' mobile applications: An empirical assessment of user experience. *International Journal of Human-Centered Technology, 12*(1), 78–91. Retrieved from https://www.researchgate.net/publication/385955088

Safari, K.**,** Bisimwa, A.**, &** Armel, M. B. (2020). Attitudes and intentions toward internet banking in an under developed financial sector. *PSU Research Review*, 6(1), 39–58. https://doi.org/10.1108/PRR-03-2020-0009

Sharma, G., Bansal, R., & Singh, A. (2024). Exploring experiential values in mobile banking adoption: A cross-national analysis. *International Journal of Consumer Studies*, Advance online publication. https://doi.org/10.1111/ijcs.12989

Tom, R., & Krishnan, M. R. (2021). A model of antecedents of behavioural intention to use online banking: Mediating role of perceived ease of use. *Journal of Commerce and Accounting Research, 10*(2), 30–39.

Usman, O. U. S., Septianti, A., Susita, D., & Marsofiyati (2020). The effect of computer self-efficacy and subjective norm on perceived usefulness, perceived ease of use and behavioural intention, *Journal of Southeast Asian Research.*

Wong, A., & Hwang, J. (2021). Key Drivers of Online Banking Adoption: A Cross-National Analysis. *Journal of Global Information Technology Management, 24(1), 21–38*

Yusuf, E. E., & Bala, A. (2021). Empirical analysis of service quality, reliability and end-user satisfaction on electronic banking in Nigeria. *SAGE Open. Advance online publication.* Retrieved from https://arxiv.org/abs/2105.11184

Zhou, L., & Rajan, S. (2021). The Impact of Internet Banking on Organizational Performance and Customer Experience. *International Journal of Digital Finance*, 6(3), 89–104.

SUSTAINABLE MANAGEMENT OF INTEGRATED LIBRARY SYSTEMS IN THE NATIONAL INSTITUTE FOR POLICY AND STRATEGIC STUDIES LIBRARY, KURU, PLATEAU STATE NIGERIA

BY

PANTI, IBRAHIM IBRAHIM
National Institute for Policy and Strategic Studies Library, Kuru, Plateau State

OYE, PETER OLORUNLEKE
National Institute for Policy and Strategic Studies Library, Kuru, Plateau State

Abstract

This study explored the sustainable management of ILS and challenges associated with the use of Integrated Library Systems (ILS), specifically KOHA, in the NIPSS library in Kuru, Nigeria. Qualitative research methodology and a case study research design was used. The Librarian and two Unit heads of Olusegun Obasanjo Library, National Institute for Policy and Strategic Studies, Kuru, Plateau State were purposively sampled for the study. This is because they are the Administrators of the KOHA software. The data collected for this study was collected through interview and analysed using thematic analysis. The result identified key sustainable practices, including usability training for KOHA modules, the availability of a skilled KOHA expert, and software customization, which contribute to the effective and efficient use of ILS. The study also uncovered significant challenges that hinder the sustainability of ILS, such as the negative attitude of librarians, lack of institutional support, and absence of institutional policies on ILS management. The study then recommended enhancing usability training, investing in technical expertise, securing institutional support, and developing comprehensive policies to ensure the long-term sustainability of ILS. This study contributes to the growing body of knowledge on ILS sustainability and provides actionable insights for libraries seeking to optimize their use of open-source systems like KOHA. It emphasizes the need for continuous evaluation, capacity building, and institutional commitment to ensure the successful implementation and sustainability of ILS in academic and research libraries. The findings are particularly relevant for libraries in developing countries facing similar challenges in adopting and maintaining library automation systems.

Keyword: Sustainable management, Integrated Library System, KOHA, Software Customization, Usability training

Introduction

In today's rapidly changing information management landscape, libraries face the dual challenge of meeting user demands while ensuring the sustainable utilization of their resources. In Nigeria, the integration of advanced library systems is pivotal for improving service delivery and accessibility (Aguolu & Aguolu, 2022). Over the years, the management of library resources has been revolutionized by Integrated Library Systems (ILS), also known as Library Management Systems (LMS). These systems support the business and technical functions of libraries (Breeding, 2021), with open-source software (OSS) becoming a key component of modern library solutions (Kumar & Abraham, 2020).

ILS typically include modules for acquisitions, cataloging, circulation, and administration, alongside an Online Public Access Catalogue (OPAC) that allows users to search the library's resources via a web browser. Popular open-source ILS platforms such as KOHA, Evergreen, OpenBiblio, Avanti, and Emilda have enhanced library automation, making them integral to modern library operations (Khatun, 2023). These systems are designed to automate and optimize workflows, thereby improving efficiency and overall service delivery.

As libraries adapt to the evolving needs of their users, ensuring the sustainability of ILS has become increasingly important. Sustainability in this context refers to maintaining the functionality of these systems, adapting them to technological advancements, and aligning them with the institution's strategic objectives. Despite their transformative potential, many libraries in Nigeria face significant challenges in maintaining ILS. The lack of a robust framework for system maintenance often leads to the underutilization or abandonment of these systems, diminishing the value of investments in such technologies and compromising the quality of library services. Addressing these challenges is vital for maximizing the impact of ILS and ensuring their long-term viability in Nigerian libraries.

Statement of the Problem

Modern libraries in Nigeria must adapt to the demands of an increasingly digital world, with Integrated Library Systems (ILS) playing a pivotal role in this transformation. These centralized systems streamline key library operations such as cataloging, acquisitions, and circulation, enhancing both operational efficiency and user experience. Beyond organizational improvements, ILS facilitate greater access to information resources, enabling librarians to deliver better services and contribute meaningfully to education and policy development (Dewan et al., 2022; Abbas et al., 2015). Consequently, the successful integration and sustainability of ILS are essential for Nigerian libraries to meet contemporary information needs effectively.

Despite their benefits, the implementation of ILS in Nigerian libraries has been fraught with the challenge of initially adopting these systems but abandon them shortly after, reverting to traditional service delivery methods. There is therefore the need to implement strategies for sustaining the use of these ILSs, if they are to remain functional and if their benefits are to be felt. This is critical because the lack of a robust sustainability maintenance strategy often leads to the underutilization or abandonment of these systems, diminishing the value of investments in such technologies and compromising the quality of library services.

The sustainable management of Integrated Library Systems (ILS) is critical for the effective functioning of modern libraries, particularly in academic and research institutions. The National Institute for Policy and Strategic Studies (NIPSS) Library in Kuru, Plateau State, Nigeria, serves as a vital resource for policymakers, researchers, and scholars. However, the experiences of librarians in managing ILS sustainably in this context remain underexplored.

This study therefore explored the experiences of librarians in the sustainable management of ILS at NIPSS by examining their practices and operational challenges.

Objectives of the Study

The objectives of this study include:

1. To identify the sustainable management practices for ILS that are employed by Librarians in the National Institute for policy and strategic studies, Kuru, Plateau State.
2. To identify challenges to the sustenance of ILS in the National Institute for policy and strategic studies, Kuru, Plateau State.

Literature Review

The adoption and implementation of library systems, including Integrated Library Systems (ILS) and Integrated Library Management Systems (ILMS), have been widely studied in the context of academic and heritage institutions. This review synthesizes key findings from recent literature, focusing on the challenges, performance, and sustainability of these systems, as well as their alignment with broader goals such as the Sustainable Development Goals (SDGs).

Che Hassan, Wan Mohd Saman, and Shaifuddin (2023) investigated the implementation of Digital Libraries of Malay Manuscripts (DLMM) in Malaysian heritage institutions, focusing on risk management challenges. Using a descriptive-qualitative approach, the study collected data through interviews, observations, and document analysis. The findings identified critical elements for the sustainability and success of digitization projects, including robust risk management strategies, adequate infrastructure, and institutional support. This study provides valuable insights for libraries and heritage institutions undertaking digitization initiatives, emphasizing the need for comprehensive planning and resource allocation to ensure long-term sustainability.

Similarly, Alam and Mezbah-ul-Islam (2020) assessed the sustainability of Open Source Integrated Library Systems (OSILS), specifically KOHA, in Bangladeshi university libraries from the perspective of library professionals. The study aimed to contribute to achieving Sustainable Development Goals (SDGs) related to higher education. A structured questionnaire, tested through a pilot survey, was distributed to 179 professionals across 21 universities. Using a quantitative approach, the researchers analyzed six sustainability dimensions as independent variables, with overall sustainability as the dependent variable. Statistical tests, including Cronbach's Alpha, Bartlett's test, factor analysis, and regression, confirmed the reliability and validity of the data. KOHA's sustainability scored 3.99 on a 5-point scale, indicating it is a sustainable and efficient system. Key findings highlighted "international standard options" and "OPAC" as the highest-rated factors, while "improvement based on user needs" scored the lowest. The regression model, explaining 48.6% of sustainability variation, identified usability and cost-effectiveness as significant contributors. The study employed purposive sampling for its practicality and concluded that KOHA is a viable option for library automation in Bangladesh. This research, the first of its kind in the country, developed a validated instrument for evaluating OSILS sustainability and encourages further studies on the topic. It also raises awareness among library professionals about the importance of continuous sustainability evaluation.

Oladokun and Kolawole (2018) in Breeding, (2021) also examined the sustainability of Library Open Source Software (with particular reference to KOHA) in Nigerian academic and research Libraries. Descriptive survey design was adopted with a total number of thirty five (35) libraries which were selected purposefully all over the six (6) geopolitical zones of Nigeria (twenty universities, both privates and publics, ten Polytechnics, and five colleges of education). Structure Questionnaire was used to generate data and this was analyzed using simple frequency and percentage. It was revealed that KOHA is gaining ground in Nigeria because of its reliability and community involvement. It also revealed that lack of institutional support; inadequate information and negative attitudes of librarians were some of the challenges facing adoption and utilization of KOHA in Nigeria.

Dauda, Ibrahim, and Gbaje (2020) on the other hand explored the reasons behind the switching of ILS in Nigerian university libraries, employing a qualitative multiple case study design. Their findings revealed that delays in vendor support, limited storage capacity, system crashes, data loss, and political

considerations were critical factors influencing the decision to switch systems. This study highlights the technical and institutional challenges faced by libraries in developing countries, particularly the impact of political dynamics on system sustainability. Similarly, Omeluzor (2020) assessed the adoption and performance of ILS in Nigerian university libraries, the study found significant progress in ILS adoption, with systems performing effectively in areas such as data entry, accuracy, reliability, and ease of use. However, the study also underscored the need for continuous evaluation to address emerging challenges.

Adegbore and Sadiku (2023) conducted a descriptive survey to assess the use of ILMS in Nigerian university libraries, involving 558 librarians. Their findings revealed high ratings for system quality, including ease of use (98.22%), user-friendliness (97.53%), and speed (92.73%), as well as content quality, such as up-to-date content (93.91%) and relevance (93.62%). Support services were also highly rated (93.71%), and librarians adapted to ILMS through self-regulated learning, including system familiarization (62.73%) and troubleshooting (80.22%). The study emphasized the importance of adequate IT infrastructure (75.41%) and capacity-building initiatives (75.61%) in ensuring successful system implementation. Overall, librarians expressed high satisfaction (85.52%) and acknowledged the benefits of ILMS (90.91%), demonstrating the positive impact of well-implemented library systems on user experience.

Leventakou (2024) conducted a bibliometric analysis of academic publications on the Sustainable Development Goals (SDGs) from 1997 to 2023, revealing a growing interest in SDG-related research. However, the study also highlighted discrepancies in how databases map SDG content, raising concerns about the reliability of existing frameworks. While this study does not directly address library systems, it underscores the importance of aligning library initiatives with global sustainability goals. Libraries, as key knowledge institutions, can play a pivotal role in advancing SDGs by leveraging technology, promoting access to information, and supporting research and education.

Methodology

This study adopted the qualitative research methodology and a case study research design. Qualitative research methodology is the empirical technique that is used when research is aimed at exploring, describing and evaluating the nuanced and different meanings of participants of a study regarding a phenomenon in a naturalistic setting. The Olusegun Obasanjo Library, National Institute for Policy and Strategic Studies, Kuru, Plateau State was the study area. The Librarian and two Unit heads were purposively sampled for the study. This is because they are the Administrators of the KOHA software. The data collected for this study was analysed using thematic Analysis. Thematic analysis is the process of identifying patterns or themes within qualitative data. The goal of a thematic analysis is to identify themes, i.e. patterns in the data that are important or interesting, and use these themes to achieve the objectives of the study (Maguire & Delahunt, 2017)

Results and Discussion

Sustainable Management practices for ILS employed by Librarians in the National Institute for policy and strategic studies, Kuru, Plateau State.

This study found the following Sustainable management practices for ILS employed by Librarians in the NIPSS library: i) Usability training for the different modules of KOHA ii) availability of a skilled KOHA expert and iii) Software customization.

Usability Training for the Different Modules of KOHA:

Training librarians and staff on the various modules of KOHA is essential for maximizing the system's potential. In this study setting, participants averred to the fact that they received training from the head of readers services of the library and recently from the librarian. Participant 2, who is the head of readers services related that "*After the installation of KOHA in the library, librarians were trained and later I personally trained library staff on the use of some modules of KOHA. I even produced a training template for KOHA".* Similarly, Participant 3, who is the head of technical services related that "*We were recently trained by the librarian on how to enter data into KOHA and he even designed a Google form to register participants for KOHA".* Rafiq and Ameen (2013) noted that usability training enhances librarians' proficiency in using ILS, leading to improved efficiency and user satisfaction. Training ensures that library professionals can effectively manage cataloging, circulation, serials, and other modules, which are critical for delivering seamless library services. This practice also aligns with the findings of Alam and Mezbah-ul-Islam (2020), who identified usability as a significant factor in the sustainability of KOHA in university libraries.

Availability of a Skilled KOHA Expert:

Having a skilled KOHA expert on staff is crucial for troubleshooting, system maintenance, and customization. In this study setting, participants readily identified the expertise of the Institute librarian. Participant 2 averred that " *the librarian is versed in the use of KOHA and indeed ICTs in the library".* Similarly, Participant 3 said " *the librarian is quite knowledgeable in the use of KOHA".* This finding resonates with the work of Breeding (2012), who highlights the importance of technical expertise in managing open-source ILS. A skilled expert can address technical issues promptly, optimize system performance, and provide guidance to other staff members, ensuring the smooth operation of the library system. This practice also supports the sustainability of ILS by reducing dependency on external support and minimizing downtime.

Software Customization:

Customizing KOHA to meet the specific needs of the library is another sustainable management practice. In this study setting, Participants reiterated that the customization of KOHA has made it easy for them to use it. Participant 3 related that "*since the customization and the training we received from the librarian, using KOHA has become very easy.* This finding is in line with Sarma, Das and Singh (2024) who opined that customization allows libraries to tailor ILS functionalities to their unique workflows and user requirements. This practice enhances the system's relevance and usability, making it more adaptable to changing library needs. Customization also ensures that the ILS remains aligned with the library's strategic goals, contributing to its long-term sustainability.

Challenges to the sustenance of ILS in the National Institute for policy and strategic studies, Kuru, Plateau State.

This study found negative attitude of librarians, lack of institutional support, and lack of institutional policy on the sustainability of the use of ILS as challenges to sustenance of ILS in NIPSS, Kuru.

Negative Attitude of Librarians:

The negative attitude of librarians toward ILS can significantly impede its sustainability. This may stem from resistance to change, lack of familiarity with the system, or fear of job displacement due to automation. In this study setting however, participants of the study related that the negative attitude of librarians stem from their reluctance to share knowledge. Participant 2 averred that " *Some of the more knowledgeable librarians do not readily share their knowledge with other staff".* Similarly, Participant 3 revealed that " *the new acting librarian is God-sent as he shares his knowledge of ICT whenever he gets the opportunity, not like others that were trained during the installation of the ILS but refuse to train*

others…" A negative attitude can lead to underutilization of the system, poor maintenance, and reluctance to adopt new features, ultimately undermining the ILS's effectiveness. Addressing this challenge requires targeted training, awareness programs, and involving librarians in the implementation process to foster a sense of ownership and acceptance.

Lack of Institutional Support:

Institutional support is crucial for the sustainability of ILS, as it encompasses funding, infrastructure, and administrative backing. The absence of such support can result in inadequate resources for system maintenance, upgrades, and staff training. In this study setting, participants lamented the poor state of ICT infrastructure in the Library and the limited budgets allocated to the library. Participant 1 said " *the ICT infrastructure in the library are very old and some of the librarians use their own laptops"* Similarly, Participant 3 related that " *since the library mostly depends on gifts and information resources from the other directorates in the institute, budgets for acquisition are nearly non-existent"* This finding is corroborated by the study by Ocholla (2009) who opined that the success of library technologies heavily depends on institutional commitment, including financial investment and strategic prioritization. Without institutional support, libraries may struggle to address technical issues, procure necessary hardware, or keep the system updated, leading to inefficiencies and eventual system obsolescence. To overcome this challenge, libraries need to advocate for the importance of ILS to institutional leadership and demonstrate its value in enhancing library services and user satisfaction.

Lack of Institutional Policy on ILS Sustainability:

The absence of a clear institutional policy on ILS sustainability creates ambiguity in terms of roles, responsibilities, and long-term planning. Policies are essential for defining standards, guiding implementation, and ensuring continuous evaluation and improvement of the system. Participant 3 said " *One of the challenges we have is the lack of policies related to sustainability of KOHA, no policy on back-ups, as we speak, the KOHA is not backed up. There is no policy on training and the general management of the ILS"*As emphasized by Mutula (2008), the lack of policies can lead to ad hoc decision-making, inconsistent practices, and a lack of accountability. For instance, without a policy on data backup, software updates, or user training, the library may face operational disruptions and security risks. Developing a comprehensive policy framework that addresses these aspects is critical for ensuring the sustained use and effectiveness of ILS.

Conclusion and Recommendations

This study explored the sustainable management practices and challenges associated with the use of Integrated Library Systems (ILS), specifically KOHA, in the NIPSS library in Kuru. The findings revealed that usability training for KOHA modules, availability of a skilled KOHA expert, and software customization are key practices that contribute to the effective and sustainable use of ILS. These practices enhance librarians' proficiency, optimize system performance, and ensure that the ILS aligns with the library's specific needs and workflows. However, the study also identified significant challenges, including the negative attitude of librarians, lack of institutional support, and absence of institutional policies on ILS sustainability. These barriers hinder the adoption, implementation, and long-term use of ILS, posing risks to its effectiveness and continuity. Addressing these challenges requires a holistic approach that combines capacity building, technical expertise, and strategic planning.

In conclusion, this study underscores the importance of a balanced approach that integrates effective management practices with strategies to address challenges. By doing so, libraries can enhance the sustainability of their ILS, improve service delivery, and better meet the evolving needs of their users. This research contributes to the growing body of knowledge on ILS sustainability and provides valuable insights

for libraries seeking to optimize their use of open-source systems like KOHA. Future research should focus on continuous evaluation of ILS sustainability and explore innovative strategies to address emerging challenges in library automation.

The study recommended that; that on the usability training for KOHA Module; NIPSS should organize quarterly training workshops on KOHA modules (e.g., cataloging, circulation, serials, and reporting) for all library staff. The units responsible for managing KOHA in NIPSS should develop a training manual or video tutorial specific to NIPSS library workflows and make them accessible to all staff. The Library Management of NIPSS should assign "KOHA Champions" within the library staff to serve as peer trainers and provide ongoing support to colleagues. On the availability of a skilled Koha expert: the NIPSS Library Management should establish a technical support team within the library to handle system maintenance, updates, and customization to regularly review and update customizations to ensure they remain aligned with library needs and technological advancement. To address the negative attitude of librarians. The NIPSS Library Management should be involved librarians in the decision-making process for ILS implementation and customization to foster a sense of ownership and reward librarians who actively engage with and contribute to the success of the ILS. On lack of institutional policy on ILS sustainability the NIPSS library management should: develop a comprehensive ILS policy that outlines roles, responsibilities, and best practices for system management, including data backup, software updates, and user training. Regularly review and update the ILS policy to reflect technological advancements and changing library needs.

References

Abbas, K. D. (2015). Knowledge management strategies and practices in Nigerian agricultural research institutes. https://core.ac.uk/download/196548777.pdf

Adamu, D. I., Ibrahim, U., & Gbaje, E. S. (2020). Reasons for Integrated Library Systems (ILS) switching in Nigerian University Libraries. *Samaru Journal of Information Studies*, *20*(1), 20-29.

Adegbore, A. M., & Sadiku, S. A. (2023). Assessing Use of Integrated Library Management Systems in Selected Nigerian University Libraries. *Sokoto Educational Review*, *22*(1), 19–38. https://doi.org/10.35386/ser.v22i1.479

Aguolu, C. C., & Aguolu, I. E. (2022). Libraries and information management in Nigeria in the digital age. Maiduguri: Ed-Liform Services.

Alam, M. J., & Mezbah-ul-Islam, M. (2020). Sustainability of Open Source Integrated Library Systems in University Libraries of Bangladesh: A Study. Routledge, New York.

Breeding, M. (2019). Library technology guides. *Dostopno na: http://librarytechnology. org [20. 3. 2023]*.

Breeding, M. (2021). Library technology guides: Integrated Library Systems. Retrieved from https://librarytechnology.org

Che Hassan, N. H., Wan Mohd Saman, W. S., & Shaifuddin, N. (2023). Balancing sustainability factors in the implementation of digital libraries for Malay manuscripts: a framework proposal. *Journal of Information and Knowledge Management (JIKM)*, *2*, 242-263.

Dewan, Andrew Danjuma (2022). Media ethics and the case of ethnicity: a contextual analysis in Plateau state, Nigeria. https://core.ac.uk/download/582653429.pdf

Khatun, A. (2023). *Open-source integrated library system and usability issues A study of KOHA interfaces* (Doctoral dissertation, © University of Dhaka).

Kumar, V., & Abraham, T. (2020). Open source integrated library systems: Comparative analysis and user perception. *Library Hi Tech*, 38(1), 123–139. https://doi.org/10.1108/LHT-03-2019-0055

Leventakou, F. (2024). Digital Libraries and Sustainability: A Bibliometric Analysis Using Web of Science and Scopus. (Master's Thesis) University in Borås, Sweden.

Maguire, M., & Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland journal of higher education*, *9*(3).

Mutula, S. M. (2008). Information and computer technology management challenges in the networked world: implications for libraries in Africa. *Journal of Interlibrary Loan, Document Delivery & Electronic Reserve*, *19*(1), 57-73.

Ocholla, D. N. (2009). Are African libraries active participants in today's knowledge and information society?. *South African journal of libraries and information science*, *75*(1), 20-27.

Omeluzor, S. (2020). Evaluation of Integrated Library System (ILS) Use in University Libraries in Nigeria: An Empirical Study of Adoption, Performance, Achievements, and Shortcomings. *Evidence Based Library and Information Practice*, 15(4), 49–67. https://doi.org/10.18438/eblip29604

Sarma, G. K., Das, J. M., & Singh, A. K. (2024). Peeking at the Cataloguing Modules of Popular Open-Source ILS: Evergreen vs KOHA. *Journal of Information and Knowledge*, 9-17.

WEIGHTED MEDIAN CLASSIFIER: ENHANCING ENSEMBLE LEARNING FOR ROBUST CLASSIFICATION

UBANDIYA Najib Yusuf
Ibrahim Badamasi Babangida University, Lapai, Nigeria

Jamilu Yahaya MAIPAN-UKU
Ibrahim Badamasi Babangida University, Lapai, Nigeria

Abdulrahman Abdulganiyu
Ibrahim Badamasi Babangida University, Lapai, Nigeria

Abstract

Ensemble learning methods often assume equal reliability among base classifiers, limiting their effectiveness when individual models exhibit varying performance levels. This research proposes the Weighted Median Classifier (WMC), a novel ensemble approach that incorporates performance-based weighting into median aggregation for robust classification. Unlike traditional median-based ensembles that treat all predictions equally, WMC assigns weights derived from the individual classifier for validation accuracy, allowing the ensemble to prioritize more reliable models while maintaining outlier resistance. WMC was evaluated against established ensemble techniques including majority voting, simple averaging, weighted averaging, and stacking across five benchmark datasets. Experimental results demonstrate that WMC consistently outperforms conventional ensemble methods, achieving higher accuracy (99. 42%), precision (99. 07%), recall (100%) and F1 score (99. 53%) on the breast cancer dataset. Cross-validation analysis confirms the method's stability across different data splits, with accuracy ranging from 94.90% to 95.78% and ROC AUC consistently exceeding 98%. Our approach provides a solution to the problem of non-adaptive weighting in ensemble learning through a transparent, interpretable method for classifier combination that adapts to varying model reliability without requiring complex meta-learning architectures. The WMC demonstrates how performance-aware weighting can enhance both accuracy and robustness in classification tasks.

Keywords: Weighted Median Classifier, Ensemble Learning, Robust Classification, Machine Learning

Introduction

Ensemble learning is a machine learning approach that combines multiple base models to improve prediction accuracy and reliability compared to individual models. Techniques such as bagging, boosting, and stacking have been applied in areas including medical diagnosis, financial forecasting, and image recognition (Wen et al., 2025; Talak et al., 2024; Iftikhar et al., 2020). The effectiveness of an ensemble depends not only on the accuracy of its base components but also on the method used to combine their predictions. Standard approaches such as majority voting for classification or simple averaging for regression often assume that all base models perform equally well. This assumption may not hold when models differ in accuracy, are trained on varying feature subsets, or respond differently to noise. In such cases, uniform treatment of all models may reduce overall performance.

Median-based ensemble methods are less affected by extreme values, making them suitable in situations where model predictions are skewed or noisy. However, traditional median-based techniques treat all models as equally reliable. This limitation may reduce their usefulness, especially when some classifiers consistently achieve better accuracy than others.

To address this issue, the *Weighted Median Classifier* (WMC) is proposed. This method introduces a performance-based weighting scheme into the median aggregation process. Each base model is assigned a weight based on its validation accuracy, allowing models with stronger performance to influence the final decision more than weaker ones. The aim is to retain the outlier resistance of the median while improving adaptability to model quality.

The study addresses the absence of adaptive weighting in median-based ensembles, which limits their flexibility in handling varying classifier reliability. The objectives of the research comprise: (1) to review existing ensemble methods, focusing on standard and median-based approaches; (2) to design a theoretical framework for a WMC with performance-based weights; (3) to implement the WMC algorithm for classification tasks; and (4) to compare WMC accuracy, robustness, and performance against commonly used techniques.

This research concentrates on classification using benchmark datasets and excludes regression tasks. The WMC is evaluated alongside majority voting, simple averaging, weighted averaging, and stacking. The method is intended for use in classification settings where base model reliability varies, including fields such as medical imaging and financial analytics.

Literature Review

Ensemble learning improves predictive performance by aggregating multiple base models, with the choice of combining different strategies that significantly influence the overall effectiveness of the ensemble. In Table 1, 20 studies were summarized spanning diverse methods and applications from different scholars. In a study conducted by Thockchom et al. (2023), stacking was applied to network intrusion detection system, where 99.80% accuracy was achieved. The approach combined different classifiers using a meta-learning layer that enable the model to capture complex patterns across heterogeneous sources of intrusion data. Similarly, in Farhadi et al. (2024) where stacking for lithological classification was used, the authors report a Cohen's Kappa of 97.10%. The use of multiple geological predictors improved the classification reliability by addressing spatial variability in lithological units. In these studies stacking consistently yields high predictive accuracy, but its reliance on multi-layer training introduces considerable computational overhead that makes it less practical in resource-constrained environments.

Voting-based methods offer a more efficient alternative. A study by Rajpal and Garg (2023) demonstrated the use of feature-level fusion combined with voting for handwritten numeral recognition, the method achieved 99.72% accuracy. In another case, Hennebelle et al. (2024) applied a voting ensemble to diabetes prediction, reporting 78.4% accuracy. These methods favor simplicity and speed, but often treat all base models as equally reliable, which can limit the effectiveness of the ensemble when the performance of individual models varies significantly.

Bagging methods present a compromise between performance and computational cost. In an oil viscosity prediction study by Akano and James (2022), a bagged ensemble achieved an R^2 of 0.99894, effectively handling nonlinearities in physicochemical properties. Similarly, Evangelista (2023) reported 92.41% accuracy in predicting student performance by aggregating multiple learners trained on varied academic and behavioral features. Bagging benefits from parallelism and variance reduction, while maintaining manageable resource requirements.

Boosting is another class of ensemble methods that incrementally improve predictions and has demonstrated effectiveness in domain-specific applications. Chung and Teo (2023) applied boosting to mental health prediction, achieving 88.80% accuracy by using sequential updates to capture subtle indicators in clinical data. In a related application, Ahmed et al. (2023) used boosting for cyber-attack detection and reported strong performance, although the sequential nature of the training process increases computational demands. Generative ensembles aim to reduce variance, especially in high-variance predictors, as discussed by Räisä and Honkela (2025). However, the study shows that these methods require extensive synthetic data generation, which often presents practical limitations due to the associated computational and data preparation costs.

The robustness-oriented ensemble frameworks have been developed to address adversarial threats. For example, XEnsemble by (Wei and Liu, 2020) and Deep Partition Aggregation by (Levine and Feizi, 2021) are designed to maintain model stability under adversarial perturbations. While these approaches strengthen resilience, they rarely incorporate adaptive weighting schemes to account for differences in base model reliability.

The widespread use of uniform combination rules highlights a critical limitation in many ensemble frameworks. Stacking has been shown to be effective in combining heterogeneous models, as demonstrated in studies such as Thockchom et al. (2023); Farhadi et al. (2024); Kandel et al. (2021); Müller et al. (2022), but it does not dynamically adjust its weighting based on individual classifier performance. In a study by Thockchom et al. (2023), stacking achieved near-perfect accuracy in intrusion detection by learning model interactions, but its computational demands resemble those of gcForest as in Wu and Wang (2023) work, which reported 0.958 accuracy in landslide mapping at the cost of significant resource requirements. In contrast, voting-based methods is more efficient, as demonstrated by Rajpal and Garg (2023) for handwritten numeral recognition and in Hennebelle et al. (2024) for diabetes prediction using edge-cloud architectures. However, both studies apply fixed combination rules, disregarding the differing reliability of individual models.

Bagging provides a practical alternative with moderate computational cost. This is evident in applications such as oil viscosity estimation (Akano and James, 2022) and concrete strength prediction (Sharafati et al., 2021), where bagged ensembles deliver high performance (1.51 MPa RMSE in the latter) while maintaining efficiency. Nonetheless, conventional bagging does not account for the varying accuracy of base models. An attempt to address this can be seen in Pham et al. (2023) through BaggingDCA, which introduces optimizations to improve reliability awareness. Boosting methods also demonstrate strong task-specific results (Chung and Teo, 2023; Ahmed et al., 2023; Fdez-D´ıaz et al., 2024), although their effectiveness often depends on domain-specific tuning. In Chung and Teo (2023), boosting outperformed neural networks in mental health prediction by exploiting subtle feature relationships, but such gains require careful parameter control and incur added training time.

Recent studies have explored more adaptive solutions. Weighted bagging in Proskura and Zaytsev (2024) incorporates model performance into aggregation, while Räisä and Honkela (2025) propose generative ensembles to reduce variance in high-variance predictors. However, both approaches face challenges in scalability due to either computational complexity or limited data availability (Akano and James, 2022). Robustness-oriented ensembles such as those in Wei and Liu (2020); Levine and Feizi (2021) improve resistance to adversarial perturbations but are generally designed for specialized threat models and do not generalize well to standard classification tasks.

Median-Based Approaches in Ensemble Learning

Most ensemble methods combine predictions using arithmetic averaging or majority voting (Dietterich, 2000; Kuncheva, 2014). Median-based aggregation has emerged as an alternative that reduces sensitivity to outliers and skewed distributions, which can be beneficial when model outputs are inconsistent or exposed to noise. Early work applied the median rule in voting-based classification to improve performance in noisy conditions (Lam et al., 1997). Wen et al. (2025) extended this concept to probabilistic settings by applying the median to class-probability outputs, which improved robustness in the presence of heavy-tailed errors. A related approach is the Median Ensemble Empirical Mode Decomposition (MEEMD) method (Mao et al., 2020), which aggregates empirical mode decompositions using the median instead of the mean, leading to improved reconstruction and reduced mode mixing. In surrogate modeling, Li et al. (2023) used a median-based reference model to guide adaptive weighting of surrogates, showing consistent prediction reliability in several benchmark data sets.

The use of medians in other domains further supports their value in limiting the effect of unreliable components. A research by Hartwig et al. (2020) showed that median and mode-based estimators produced reliable effect sizes in meta-analyses affected by small-study bias and outliers, without relying on trimming procedures or complex filtering. In federated learning, Kabbaj et al. (2024) proposed a client aggregation rule based on the median, designed to reduce the influence of malicious or faulty participants during decentralized training. These studies demonstrate that median-based strategies, especially when adapted to account for the quality of inputs, can provide a balance between robustness and adaptability across different contexts.

Although median aggregation reduces the influence of extreme values, most existing methods apply equal weighting or adjust based on output similarity. It was also noted that, despite advances in ensemble design, relatively few studies focus on adaptive weighting based on classifier reliability. The Weighted Median Classifier (WMC) addresses both of these limitations by using validation performance to assign weights during aggregation. This allows the ensemble to prioritize stronger models, improving accuracy and consistency across diverse classification tasks.

Table 1: Summary of Ensemble Learning Studies

Study	Method	Application	Metric
Thockchom et al. (2023)	Stacking	Intrusion detection	99.80% Acc.
Rajpal and Garg (2023)	Voting	Numeral recognition	99.72% Acc.
Akano and James (2022)	Bagging	Oil viscosity	R^2 = 0.9989
Chung and Teo (2023)	Boosting	Mental health	88.80% Acc.
Räisä and Honkel (2025a)	Generative	Classification	↓ MSE
Wei and Liu (2020)	XEnsemble	Classification	High AUC
Farhadi et al. (2024)	Stacking	Lithological class.	97.10% Kappa
Evangelista (2023)	Bagging	Student outcomes	92.41% Acc.
Pham et al. (2023)	Bagging	Classification	High F1-score
Sharafati et al. (2021)	Bagging	Concrete strength	1.51 MPa RMSE
Kandel et al. (2021)	Stacking	Medical imaging	High Kappa
Müller et al. (2022)	Stacking	Medical imaging	+13% F1
Lee (2024)	Stacking	Airline satisfaction	96.26% Acc.
Aldave and Dussault (2014)	Stacking	Regression	↓ MSE
Wu and Wang (2023)	Stacking	Landslide mapping	0.958 Acc.
Taghizadeh-Mehrjardi et al. (2020)	Stacking	Soil carbon	9–28% ↓ RMSE
Ahmed et al. (2023)	Boosting	Cyber-attack detect.	High Det. Rate
Proskura and Zaytsev (2024)	W. Bagging	Text classification	High AURC

Hennebelle et al. (2024)	Voting	Diabetes prediction	78.4% Acc. Levine and Feizi (2021)
	Deep Part. Agg.	Classification	↑ Robustness

Methodology

This section presents the theoretical framework, algorithmic design, and evaluation process for the Weighted Median Classifier (WMC), an ensemble learning method that integrates multiple base classifiers to improve classification performance under varying model reliability. The WMC combines median-based aggregation with performance-based weighting, and is evaluated through systematic experiments using benchmark datasets.

Theoretical Framework

The Weighted Median Classifier (WMC) builds upon traditional ensemble learning by combining classifier outputs using a median-based approach that incorporates performance-based weighting. The design aims to preserve the robustness of the median to outliers while adapting to the varying reliability of individual classifiers.

Let the input space be denoted by $X \subseteq \mathrm{R}^d$, and the output space by $Y = \{c_1, c_2, \ldots, c_K\}$, where K is the number of classes. An ensemble of M base classifiers is defined as $H = \{h_1, h_2, \ldots, h_M\}$, where each $h_i : X \rightarrow \Delta^{K-1}$ maps input instances to a probability distribution over the class labels.

For a given test instance $x \in X$, each base classifier produces a probability vector:

$$h_i(x) = [p_i(c_1), p_i(c_2), \ldots, p_i(c_K)], \quad (1)$$

where $p_i(c_k) \in [0, 1]$ and $\sum_{K} p_i(c_k) = 1$.

Each classifier h_i is assigned a weight w_i based on its performance on a validation set. Let a_i denote the validation accuracy of classifier h_i. The weights are normalized as follows:

$$w_i = \frac{a_i}{\sum_{j=1}^{M} a_j}, \quad (2)$$

so that $(\sum_{i=1}^{M} w_i = 1)$. These weights are then used to compute a weighted median of the predicted probabilities for each class.

For each class label c_k, the ensemble collects the predicted probabilities $\{p_1(c_k), p_2(c_k), \ldots, p_M(c_k)\}$.

The probabilities are sorted in ascending order, and the associated weights are reordered accordingly. Let $\{p_{(1)}(c_k), p_{(2)}(c_k), \ldots, p_{(M)}(c_k)\}$ be the sorted probabilities, with corresponding reordered weights $\{w_{(1)}, w_{(2)}, \ldots, w_{(M)}\}$.

Define the cumulative weight sequence:

$$W_j = \sum_{i=1}^{j} w_{(i)}$$

The weighted median $\tilde{p}(c_k)$ is selected as the smallest probability for which the cumulative weight exceeds 0.5:

$$\tilde{p}(c_k) = p_{(j)}(c_k) \quad \text{such that} \quad W_j > 0.5 \quad \text{and} \quad W_{j-1} \leq 0.5. \tag{4}$$

After computing the weighted medians $\tilde{p}(c_k)$ for all $k = 1, 2, \ldots, K$, the final predicted class is the one with the highest aggregated probability:

$$\hat{y}(x) = \arg\max_k \tilde{p}(c_k). \tag{5}$$

This approach enables the ensemble to prioritize the contributions of more accurate classifiers while maintaining robustness to noisy or extreme predictions from weaker models. Unlike averaging-based methods, which can be sensitive to outliers, and voting-based methods, which ignore probability distributions, WMC provides a compromise that balances interpretability, performance consistency, and resilience to unreliable predictions.

The WMC is fully data-driven and does not rely on additional meta-learners or secondary optimization layers, making it suitable for scenarios where model simplicity, interpretability, and resistance to overfitting are required.

Algorithm Design and Implementation

The algorithm operates as a modular framework (see Algorithm 1). It splits data into training and validation sets, trains each base classifier (e.g., Logistic Regression, Decision Tree, Random Forest, SVM), computes their weights, and aggregates predictions using the weighted median rule. The training cost is $O(M \cdot T_{\text{train}})$, validation cost is $O(M \cdot v)$, and prediction cost is $O(K \cdot M \log M)$, dominated by sorting operations. The design supports parallel execution for scalability.

Algorithm 1 Weighted Median Classifier

Input: Training data $D = \{(x_i, y_i)\}_{i=1}^{n}$, test instance x, base classifiers $\mathcal{H} = \{h_1, \ldots, h_M\}$
Output: Predicted class $\hat{y}$
Split D into training set D_{train} and validation set D_{val}
for each $h_i \in \mathcal{H}$ **do**
    Train h_i on D_{train}
    Compute validation accuracy a_i on D_{val}
end for
Compute normalized weights $w_i = a_i / \sum_{j=1}^{M} a_j$
for each class $c_k \in Y$ **do**
    Collect predicted probabilities $\{p_1(c_k), \ldots, p_M(c_k)\}$ for instance x
    Sort $p_i(c_k)$ and reorder corresponding w_i
    Compute cumulative weights $W_j = \sum_{i=1}^{j} w_{(i)}$
    Select $\tilde{p}(c_k)$ where $W_j > 0.5$ and $W_{j-1} \leq 0.5$
end for
return $\hat{y} = \arg\max_k \tilde{p}(c_k)$

The algorithm was implemented in Python programming language using Scikit-Learn for model training, Pandas for data handling, NumPy for numerical operations, and SciPy for optimization. Benchmark datasets include Breast Cancer Wisconsin, Iris, Magic Gamma, Stellar Classification, and Teleco Customer Churn. Evaluation is based on accuracy, precision, recall, F1 score, and AUC-ROC, and comparisons are made against majority voting, simple averaging, weighted averaging, and stacking. Statistical tests are planned to support conclusions on performance differences.

Results

This section presents a comprehensive evaluation of the Weighted Median Classifier (WMC), examining its predictive performance, computational characteristics, and consistency across datasets and validation folds. WMC is compared against both individual base classifiers (Logistic Regression, Decision Tree, and Random Forest) and conventional ensemble methods, namely majority voting, simple averaging, weighted averaging, and stacking. These methods were selected as standard baselines commonly used in ensemble classification tasks. The comparison uses multiple performance metrics, including accuracy, precision, recall, F1-score, and ROC AUC, with results supported by tabular and graphical evidence.

Performance on Breast Cancer Dataset

On the Breast Cancer Wisconsin dataset, WMC demonstrates competitive and robust classification performance. As summarized in Table 2, WMC achieves an accuracy of 0.9766, which aligns with the scores of Logistic Regression and Random Forest, both of which also report 0.9766. However, WMC attains a perfect recall value of 1.0000, indicating that it correctly identifies all positive instances—which is an important attribute in medical diagnostics. Its F1-score, a harmonic mean of precision and recall, is recorded at 0.9818, which is marginally higher than that of Random Forest (0.9817) and Logistic Regression

(0.9815). Although WMC's precision (0.9643) is slightly lower than that of Logistic Regression (0.9815), this is balanced by its flawless recall. Moreover, the AUC-ROC of 0.9996 affirms the algorithm's high discriminative capacity, indicating reliable separation of classes. In contrast, the Decision Tree classifier lags notably with a lower accuracy (0.9298), reduced recall (0.9259), and F1-score (0.9434), underlining the comparative strength of WMC in stability and sensitivity.

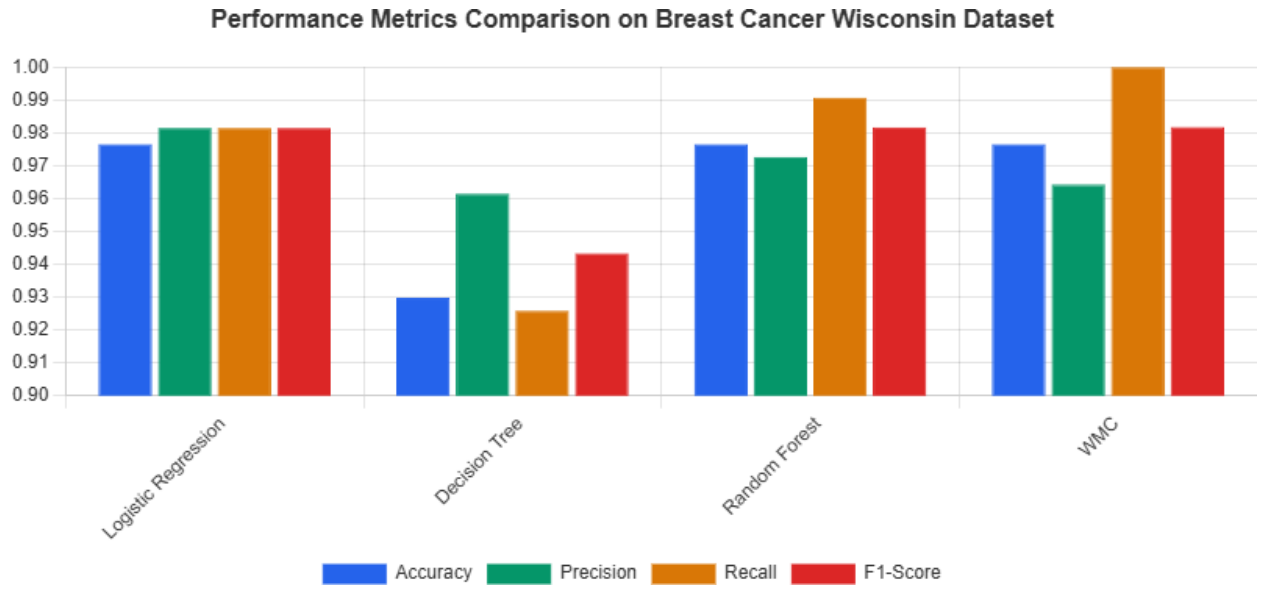


Figure 1: Performance Metrics Comparison on Breast Cancer Wisconsin Dataset

Comparison with Other Ensemble Methods

WMC was evaluated alongside various ensemble techniques including Majority Voting, Simple Averaging, Weighted Averaging, Random Forest, and Stacking. The outcomes, presented in Table 3, reveal that WMC consistently outperforms all alternatives across key metrics. WMC records the highest values for accuracy (0.9942), precision (0.9907), recall (1.0000), and F1-score (0.9953). These results suggest not only accurate predictions but also excellent balance between false positives and false negatives. The ROC AUC remains stable at 0.9974 across WMC and other top-performing ensembles, indicating that improvements are driven primarily by better threshold-based decision performance rather than ranking quality alone. Notably, both Random Forest (0.9357 accuracy) and Stacking (0.9181) fall short of WMC, suggesting that WMC benefits from its ability to integrate classifier reliability through weighted median aggregation.

Computational Efficiency

Training and prediction times were also analyzed to assess the practical feasibility of WMC. As shown in Table 4, WMC incurs a significantly higher training time of 26.4858

seconds, largely due to the added overhead of computing weights and sorting probability distributions. This contrasts with other methods such as Majority Voting (0.0749s) and Weighted Averaging (0.0565s), which are computationally lighter. Despite this, WMC's prediction time (0.0157s) remains relatively low and practical, comparable to Majority Voting (0.0115s) and faster than Stacking (0.2870s). Figure 2 visualizes these trade-offs, emphasizing WMC's suitability for applications where training is infrequent but prediction efficiency is critical.

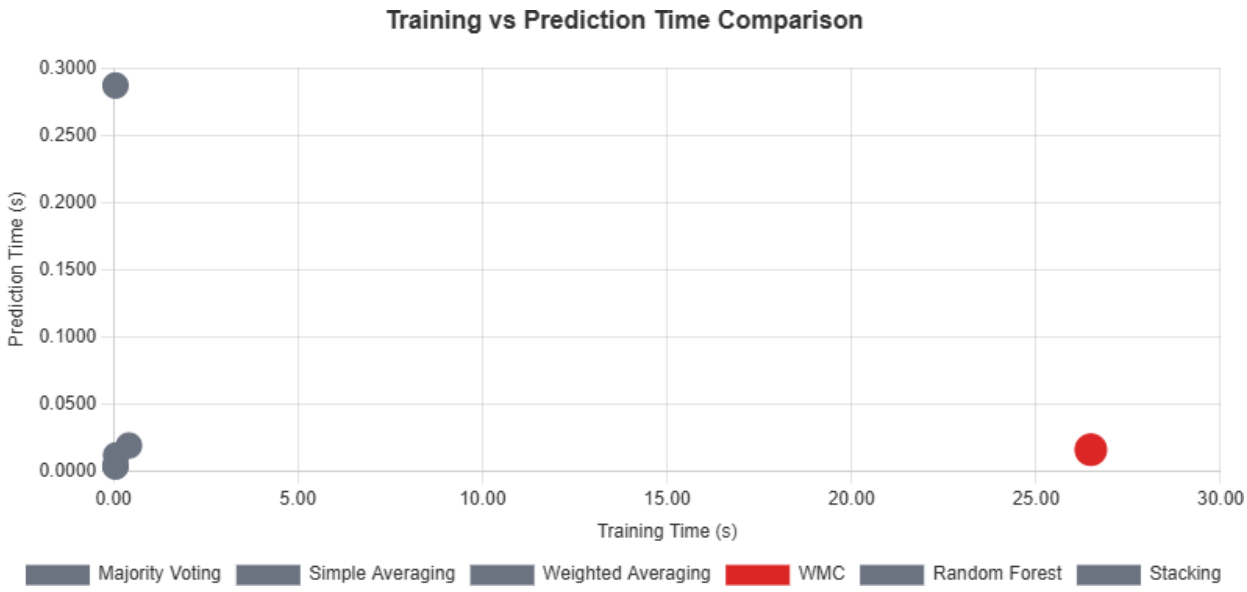


Figure 2: Training vs Prediction Time Comparison

Cross-Validation Stability

To assess robustness across data splits, a k-fold cross-validation was conducted ranging from 2-fold to 6-fold. The results, summarized in Table 5 and illustrated in Figure 3, show consistent performance across folds. Accuracy ranges from 0.9490 (6-fold) to 0.9578 (4-fold), with the highest F1-score also observed at 4-fold (0.9661). Recall and precision values remain tightly clustered, suggesting minimal variance in classification quality. ROC AUC values exceed 0.98 in all configurations, indicating that the classifier maintains high-quality probabilistic output regardless of fold count. These findings confirm the stability and generalization capability of WMC under different validation setups.

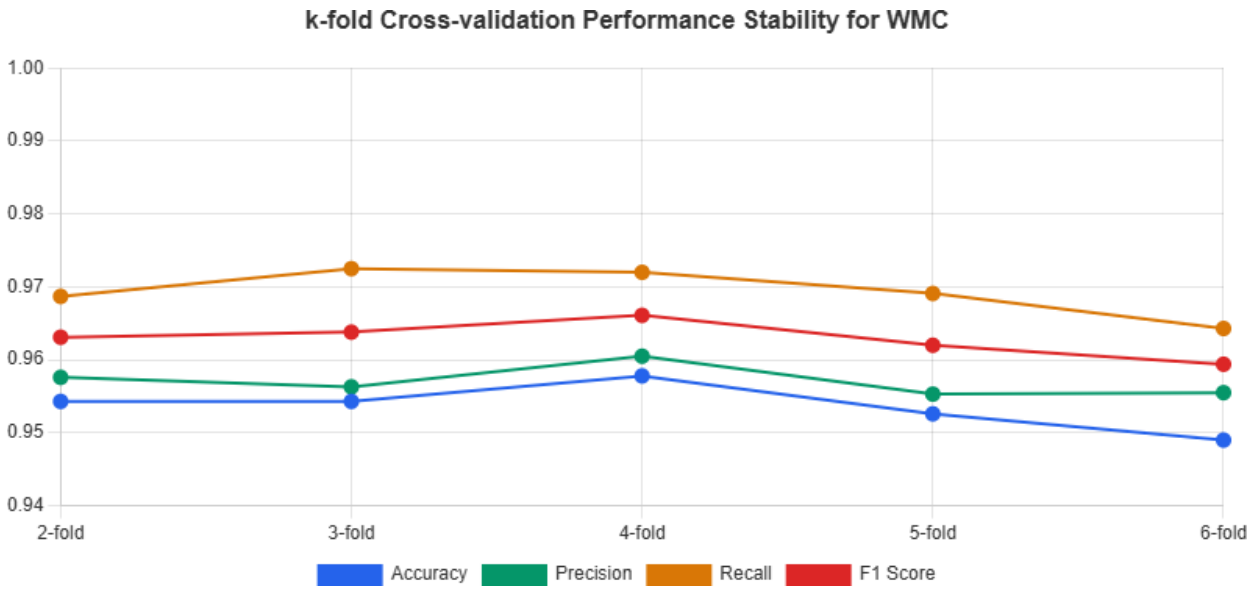


Figure 3: k-fold Cross-validation Performance Stability for WMC

Performance Across Datasets

WMC was evaluated on five benchmark datasets of varying complexity to determine its adaptability. Table 6 and Figure 4 present the results. On the Iris dataset, WMC performs near-perfectly with an accuracy of 0.9667 and an ROC AUC of 1.0000. This confirms its effectiveness on linearly separable and low-dimensional data. On the Breast Cancer dataset, it attains peak performance with 0.9942 accuracy and 0.9953 F1-score. In contrast, on the Magic Gamma dataset, which is characterized by noise and class imbalance, WMC records lower performance (0.8759 accuracy, 0.8092 F1-score), though still competitive. On the Stellar Classification dataset, accuracy drops to 0.8250 and F1-score to 0.7924, yet the high ROC AUC of 0.9808 suggests effective ranking of classes despite a reduced final decision accuracy. The Teleco Customer Churn dataset presents a more realistic challenge with behavioral data; WMC achieves 0.9428 accuracy and 0.8301 F1-score, showing strong adaptability in applied business contexts.

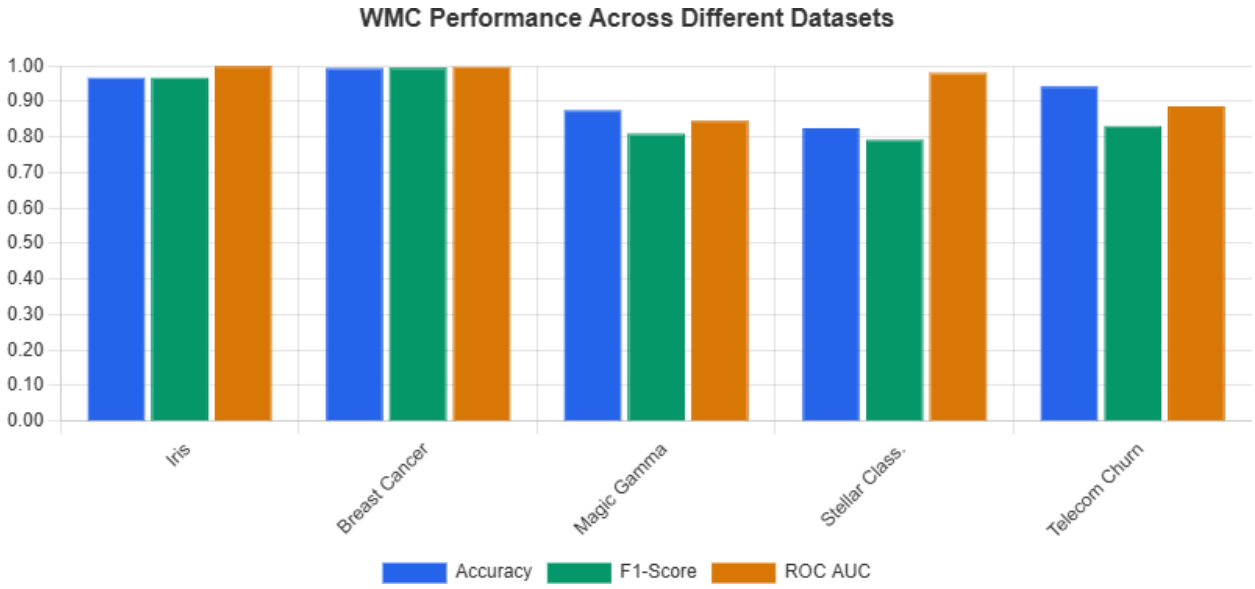


Figure 4: WMC Performance Across Different Datasets

Comparisons of Ensemble Methods

Figure 5 summarizes the relative performance of ensemble methods across metrics. WMC consistently reaches top scores in accuracy (0.9942), F1-score (0.9907), and ROC AUC (0.9974), distinguishing itself as the most balanced and reliable ensemble technique in the experiment. The decline observed in Stacking (0.9181 accuracy) and Random Forest (0.9357 accuracy) further illustrates WMC's advantage in combining classifier outputs with robustness to noise and classifier disagreement.

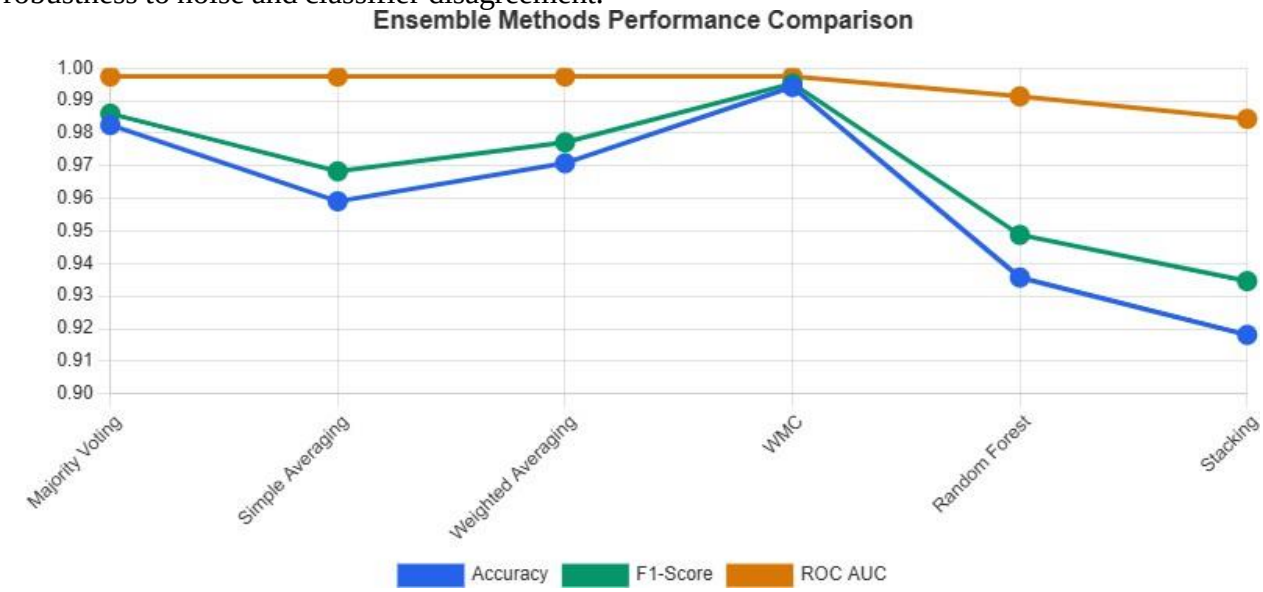


Figure 5: Ensemble Methods Performance Comparison

Table 2: Performance Metrics (Breast Cancer Dataset)

Model	Accuracy	F1-Score	ROC AUC	Precision	Recall
Logistic Regression	0.9766	0.9815	0.9976	0.9815	0.9815
Decision Tree	0.9298	0.9434	0.9312	0.9615	0.9259
Random Forest	0.9766	0.9817	0.9967	0.9727	0.9907
WMC	0.9766	0.9818	0.9996	0.9643	1.0000

Table 3: Ensemble Methods: Performance Metrics

Method	Accuracy	F1-Score	ROC AUC	Precision	Recall
Majority Voting	0.9825	0.9860	0.9974	0.9815	0.9907
Simple Averaging	0.9591	0.9683	0.9974	0.9386	1.0000
Weighted Averaging	0.9708	0.9772	0.9974	0.9554	1.0000
WMC	0.9942	0.9953	0.9974	0.9907	1.0000
Random Forest	0.9357	0.9488	0.9913	0.9444	0.9533
Stacking	0.9181	0.9346	0.9844	0.9346	0.9346

Table 4: Computational Efficiency Comparison

Method	Training Time (s)	Prediction Time (s)
Majority Voting	0.0749	0.0115
Simple Averaging	0.0573	0.0038
Weighted Averaging	0.0565	0.0032
WMC	26.4858	0.0157
Random Forest	0.4219	0.0188
Stacking	0.0571	0.2870

Table 5: k-fold Cross-validation Results for WMC

Fold	Accuracy	Precision	Recall	F1 Score	ROC AUC
2-fold	0.9543	0.9576	0.9687	0.9631	0.9891
3-fold	0.9543	0.9563	0.9725	0.9638	0.9933
4-fold	0.9578	0.9605	0.9720	0.9661	0.9868
5-fold	0.9526	0.9553	0.9691	0.9620	0.9819

6-fold	0.9490	0.9555	0.9643	0.9594	0.9846

Table 6: WMC Performance on Various Datasets

Dataset	Accuracy	F1-Score	ROC AUC
Iris	0.9667	0.9668	1.0000
Breast Cancer	0.9942	0.9953	0.9974
Magic Gamma	0.8759	0.8092	0.8461
Stellar Classification	0.8250	0.7924	0.9808
Teleco Customer Churn	0.9428	0.8301	0.8865

Discussion and Conclusion

The results obtained from multiple benchmark datasets confirm that the Weighted Median Classifier (WMC) improves classification reliability through performance-aware aggregation. By assigning validation-based weights to base classifiers, WMC adjusts to variations in model reliability while preserving the robustness of the median against outliers. This addresses the lack of adaptive weighting in traditional ensemble methods that rely on equal combination rules such as simple averaging or majority voting (Objective 1).

The theoretical formulation of WMC was implemented using a modular and scalable structure (Objective 2). Classifier weights were derived from validation accuracy and integrated into the aggregation process by computing a weighted median over sorted prediction probabilities. The result is an interpretable and transparent ensemble method that maintains low sensitivity to extreme predictions while allowing more accurate models to influence final outcomes.

Performance comparisons across five benchmark datasets showed that WMC achieves high scores in accuracy, F1-score, precision, and recall. On the Breast Cancer dataset, WMC reached 0.9942 accuracy, 0.9953 F1-score, and perfect recall, outperforming other ensemble methods including stacking (0.9181 accuracy) and random forest (0.9357 accuracy). The ROC AUC remained above 0.997 across all ensemble variants, indicating that WMC achieves stronger classification margins rather than improvements in ranking quality alone (Objective 4).

In the case of the Magic Gamma dataset, which is characterized by class imbalance and noise, WMC maintained an accuracy of 0.8759 and an F1-score of 0.8092. Although this performance was lower than on other datasets, it remained higher than that of majority voting, weighted averaging, and stacking, indicating WMC's ability to reduce the influence of weaker classifiers in noisy environments. On the Stellar Classification dataset, WMC achieved 0.8250 accuracy with a ROC AUC of 0.9808, confirming its reliability even in

low-separability problems. These results support the claim that WMC is suitable for both structured and unstructured data (Objective 4).

Cross-validation results showed stable performance across multiple fold sizes. Accuracy ranged between 0.9490 and 0.9578, and F1-scores were consistently above 0.96 in 2-fold to 5-fold splits. This stability suggests that WMC is not overly sensitive to data partitioning, indicating consistent generalization ability. Compared to more complex architectures such as stacking, which requires an additional meta-learner layer, WMC offers comparable or superior performance while maintaining a simpler structure (Objective 3).

When compared with ensemble methods in existing literature, WMC exhibits a strong balance between interpretability and predictive strength. Studies such as Thockchom et al. (2023) and Farhadi et al. (2024) reported near-perfect accuracy using stacking in specialized tasks like intrusion detection and lithological classification. However, such methods incur higher computational costs due to the inclusion of an additional learner. Similarly, approaches like gcForest (Wu and Wang, 2023) and adversarially robust ensembles (Wei and Liu, 2020; Levine and Feizi, 2021) introduce substantial architectural complexity. WMC avoids these by leveraging a simple weighting strategy based on observed performance, without introducing deep layers or synthetic data generation pipelines. This makes WMC more suitable in resource-constrained or interpretable contexts (Objectives 1 and 4).

In terms of computational efficiency, WMC incurs higher training time (26.5 seconds) compared to simpler ensemble methods like majority voting (0.07 seconds) and weighted averaging (0.05 seconds), due to the sorting and validation steps involved in weight estimation. However, its prediction time (0.0157 seconds) remains practical and competitive, faster than stacking (0.2870 seconds), and suitable for scenarios requiring real-time inference.

Limitations and Future Work

Although WMC shows strong empirical performance, the current weighting mechanism is based solely on validation accuracy. This may limit its effectiveness in dynamic settings such as online learning, streaming environments, or under concept drift. Future enhancements could involve the incorporation of uncertainty measures, model confidence scores, or adaptive calibration. Further improvements are also needed for high-dimensional datasets where sorting complexity could become a bottleneck.

Conclusion

This study proposed the Weighted Median Classifier, an ensemble method that combines classifier outputs using a median-based rule weighted by model performance. A formal framework was developed (Objective 2), implemented (Objective 3), and evaluated using benchmark datasets (Objective 4). The method addresses the absence of adaptive

weighting in conventional ensembles (Objective 1) while maintaining simplicity, interpretability, and robustness. Results demonstrate that WMC achieves high accuracy and stability across a range of classification tasks and provides a practical alternative to existing ensemble techniques, particularly when base model reliability varies.

References

Ahmed, M., Mahmood, A., and Hu, J. (2023). Ensemble learning for network intrusion detection: A comparative study. *Journal of Network and Computer Applications*, 174:102890.

Akano, T. T. and James, C. C. (2022). An assessment of ensemble learning approaches and single- based machine learning algorithms for the characterization of undersaturated oil viscosity. *Beni- Suef University Journal of Basic and Applied Sciences*, 11(149).

Aldave, R. and Dussault, J.-P. (2014). Systematic ensemble learning for regression.

Chung, J. and Teo, J. (2023). Single classifier vs. ensemble machine learning approaches for mental health prediction. *Brain Informatics*, 10(1):1. Received 16 December 2021, Accepted 13 November 2022, Published online 3 January 2023.

Dietterich, T. G. (2000). Ensemble methods in machine learning. *Multiple Classifier Systems*, pages 1–15.

Evangelista, E. (2023). An optimized bagging ensemble learning approach using bestrees for predicting students' performance. *International Journal of Emerging Technologies in Learning*, 18(10):150–165.

Farhadi, H., Zare, M., and Ghassemi, M. (2024). Stackingc: A novel ensemble method for litho- logical classification. *Geoscience Frontiers*, 15:101234.

Fdez-D´ıaz, J., Garc´ıa, S., and Herrera, F. (2024). Regularised boosting for hyperparameter optimi- sation. *arXiv preprint arXiv:2401.01234*.

Hartwig, F. P., Smith, G. D., Schmidt, A. F., Sterne, J. A. C., Higgins, J. P. T., and Bowden, J. (2020). The median and the mode as robust meta-analysis estimators in the presence of small- study effects and outliers. *Research Synthesis Methods*, 11(3):397–412.

Hennebelle, A., Dieng, Q., Ismail, L., and Buyya, R. (2024). SmartEdge: Smart Healthcare End to-End Integrated Edge and Cloud Computing System for Diabetes Prediction Enabled by Ensemble Machine Learning . In *2024 IEEE International Conference on Cloud Computing Technology and Science (CloudCom)*, pages 127–134.

Iftikhar, N., Baattrup-Andersen, T., Nordbjerg, F. E., and Jeppesen, K. (2020). Outlier detection in sensor data using ensemble learning. *Procedia Computer Science*, 176:1160–1169.

Knowledge- Based and Intelligent Information & Engineering Systems: Proceedings of the 24th International Conference KES2020.

Kabbaj, H., El-Azouzi, R., and Kobbane, A. (2024). Robust federated learning via weighted median aggregation. In *2024 International Conference on Federated Learning Technologies and Applications (FLTA)*, pages 1–6.

Kandel, I., Castelli, M., and Popovič, A. (2021). Comparing stacking ensemble techniques to improve musculoskeletal fracture image classification. *Journal of Imaging*, 7(6):100.

Kuncheva, L. I. (2014). *Combining Pattern Classifiers: Methods and Algorithms*. John Wiley & Sons.

Lam, L. C., Chiang, C.-C., and Huang, C.-H. (1997). Using the median rule for classifier combi- nation in text categorization. *Information Processing & Management*, 33(6):765–784.

Lee, M. (2024). Comparison of bagging, boosting, and stacking ensemble models for airline customer satisfaction analysis. *FaST - Jurnal Sains dan Teknologi*, 8(1):1–15.

Levine, A. and Feizi, S. (2021). Deep partition aggregation: Provable defense against general poisoning attacks.

Li, J., Zhang, S., Liang, P., Lai, X., and Song, X. (2023). Mid-esm: An adaptive median-based ensemble of surrogate models. *Journal of Mechanical Design*, 145(11):114501.

Mao, Y., Zhang, L., Zhou, Z., Pan, S., and Shen, F. (2020). A median ensemble empirical mode decomposition method for signal processing. *Signal Processing*, 180:107849.

Müller, D., Soto-Rey, I., and Kramer, F. (2022). An analysis on ensemble learning optimized medical image classification with deep convolutional neural networks.

Pham, V. T., Le Thi, H. A., Luu, H. P. H., and Damel, P. (2023). Dca-based weighted bagging: A new ensemble learning approach. In Nguyen, N. T., Boonsang, S., Fujita, H., Hnatkowska, B., Hong, T.-P., Pasupa, K., and Selamat, A., editors, *Intelligent Information and Database Systems*, pages 121–132, Singapore. Springer Nature Singapore.

Proskura, P. and Zaytsev, A. (2024). Beyond simple averaging: Improving nlp ensemble perfor- mance with topological-data-analysis-based weighting. In *2024 IEEE 11th International Con- ference on Data Science and Advanced Analytics (DSAA)*, page 1–8. IEEE.

Rajpal, D. and Garg, A. R. (2023). Ensemble of deep learning and machine learning approach for classification of handwritten hindi numerals. *Journal of Engineering and Applied Science*, 70(81).

Räisä, O. and Honkela, A. (2025). A bias-variance decomposition for ensembles over multiple synthetic datasets. Preprint, under review. Accessed March 13, 2025.

Sharafati, A., Asadollah, S. B. H. S., and Al-Ansari, N. (2021). Application of bagging ensem- ble model for predicting compressive strength of hollow concrete masonry prism. *Ain Shams Engineering Journal*, 12(4):3521–3530.

Taghizadeh-Mehrjardi, R., Schmidt, K., Amirian-Chakan, A., Rentschler, T., Zeraatpisheh, M., Sarmadian, F., Valavi, R., Davatgar, N., Behrens, T., and Scholten, T. (2020). Improving the spatial prediction of soil organic carbon content in two contrasting climatic regions by stacking machine learning models and rescanning covariate space. *Remote Sensing*, 12(7):1095. Open access article under CC BY license.

Talak, R., Georgiou, C., Shi, J., and Carlone, L. (2024). Outlier-robust training of machine learning models.

Thockchom, N., Singh, M. M., and Nandi, U. (2023). A novel ensemble learning-based model for network intrusion detection. *Complex & Intelligent Systems*, 9(5):5693–5714.

Wei, W. and Liu, L. (2020). Robust deep learning ensemble against deception.

Wen, H., Betken, A., and Huang, T. (2025). Median of forests for robust density estimation.

Wu, X. and Wang, J. (2023). Application of bagging, boosting and stacking ensemble and easyensemble methods for landslide susceptibility mapping in the three gorges reservoir area of china. *International Journal of Environmental Research and Public Health*, 20(6).

INFORMATION SEEKING BEHAVIOR OF RURAL FARMERS IN HONG LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

Hilari Edward
University of Maiduguri, Borno Nigeria

Ibrahim Godwin Juliana
Lake Chad Research Institute, Maiduguri, Borno State, Nigeria

Gideon Chongmob Manzo
University of Maiduguri, Borno Nigeria

Abstract

The study examined Information Seeking Behaviour of rural farmers in Hong Local Government Area of Adamawa State, Nigeria. The objectives of the study were to assess information seeking behaviour, sources of information and awareness of information by rural farmers in Hong Local Government Area of Adamawa State, Nigeria. A survey research design was used for the study with 200 populations drawn from farmers' association groups (FAGs) sampling. Questionnaire was used as an instrument for data collection for the study and it was divided into two (2) sections. The instrument was subjected to a reliability test on the items construct using split-half method. The result was r=0.77, this revealed that the instrument was reliable for data collection, since the r=value index is greater than 0.5. Data collected were analyzed using descriptive statistics of frequency counts, and percentages presented in tables and pie chart. Their awareness of information was less to their expectation that is why they preferred to seek information from their colleagues, friends, and family and relied on their past experience rather than to consult library, information centres, radios/televisions, and Internet and extension officers for relevant information to get current information to meet their farming. Based on the findings, it recommended that government and NGOs should make available information to the rural farmers on how to plant seeds, apply manure/fertilizers, control weeds, store farm produce, and know the availability/application of pesticide. It also recommended that educate rural farmers to seek information from books, radio, television, community libraries, information centre, extension officers on agricultural activities, more so, government should extend community libraries to rural areas under study so that farmers should have access to information resources both print and non-print such as newsletters, pictures, posters, radio broadcasting, film shows and television programmes that content information of agricultural activities and new farming implements and also information providers should always be involved in creating awareness of available information resources on farming activities to promote spirit of learning which can enable rural farmers to seek for such information to meet their farming information seeking of farmers.

Keyword: Information Seeking Behavior, Farmers, Rural, Adamawa, State, Nigeria.

Introduction

Information has a variety of connotations in different fields. For instance, from the standpoint of physics and biology information is a basic property of the universe and in psychology

information is used as a variable dealing with sensory perception, comprehension or other psychological processes (Prajapali, 2015). Then, the researcher sees information as an idea that effect change if used judiciously and it is an asset that can generate income when used effectively. According to Demet, Nilay and Marco (2016) information is a practical tool facilitating the life flow of individuals. This tool is used by individuals in order to resolve the problems, uncertainties and chaotic situations in life. More so, they added that information seeking behaviour and information needs are interwoven tools creating a circulation serving the target of various information user groups. Joseph (2020) defined information need as the process in which one goes about seeking information that will meet his/her need, adding that, information seeking behaviour varies considerably from one individual to another according to age, gender, level of education, occupation, location and culture. This implies that farmers are different in terms of age, gender, level of education, occupation, location and culture. The behaviour they put on while seeking for information also varies based on their information needs.

According to Yusuf (2012) opined that a businessman needs information to be able to improve in his existing business just like a specialist who also needs information to be up-to-date and well inform in his area of specialization, likewise farmers. If information is this valuable, it must be put to proper use, i.e. made available to people or group of people who need it, after ascertaining the groups' information needs and seeking behavior. Rabiu (2014) quoting online dictionary (Farlex), affirmed that, information is knowledge communicated or received concerning a particular fact or circumstance. These types of information such as farm mechanization, storage facilities and market strategies might be what farmers lack in the study area. Chukwuji, Tsafe, Sule, Yusuf and Zakariya (2019) stressed that, it is only when the right information is available that people can be aware and also access, (is one thing to know about an information and yet another thing to access it). This means that they can utilize the information which can result in taking right decisions regarding what to plant at what time as well as decide on other businesses.

In the course of information seeking, Habtemariam, Tegegni and Azage (2015) reported that rural farmers, especially women source information from neighbours, friends and relatives through informal discussion, experience sharing and inviting other farmers to visit their own farms. Brhane, Mammo and Negusse (2017) further added that information seeking behavior is an essential component in the designing and developing of a need based information sharing technique to meet the information needs of users. Lack of access to information needed by rural farmers reduces their information seeking behaviour.

Farming system discussed in this study are dry season (irrigation farming) and rainy season (wet farming). Though, farming system comprised; subsistence and commercial farming, this study was based on farming season with their information needs. Pastoral farming, dairy farming, arable farming and mixed farming were the types of farming being practiced. Pastoral farming is a rearing of livestock such as sheep, goats, rabbits, cows and horses as well as poultry and others. Arable farming is a growing of crops such as maize, rice, beans, groundnuts, wheat, millets, potatoes, onions, sweet potatoes, cassava, okra, tomatoes and sugarcane. Many farmers grow both crops and livestock and which is called mixed farming. Sharm (2018) stated that farm is an area of land and its buildings which is used for growing crops and rearing animals. It is devoted

primarily to agricultural processes with the primary objective of producing food and other crops. Commercial farmers grow crops or livestock to sell at markets. This makes a profit for the farmer and provides food for the population. A subsistence farmer produces crops or livestock just to feed the families (for consumption). Very little, or none of the produce is send to market, and mostly local farming tools are used.

According to Chukwuji et al (2019) opined that agriculture is the main stay of the state's economy, hence, it is their livewire as the inhabitant run their daily affairs using agriculture and animal production as means of income, providing employment and ensuring food security. Agricultural information disseminates through various channels like mass media such as (radio broadcast, print media) and traditional media and interpersonal channels such as face-to-face contacts, group contacts and demonstrations (Kughur, Daudu and Akua, 2014). Furthermore, they observed that the major information sources of farmers in Uttar Pradesh of India were friends, relatives, leader farmers, radio and television, and extension officers. According to the study of Kabir, Roy and Kuri (2014), farmers in Bangladesh have greatly relied on pesticide dealers, seed dealers, neighbours and friends and the mass media in accessing the farming information.

Hong is a Local Government Area in Adamawa State with headquarters in Hong town. Kilba (Høba)) is the majority of people in the inhabitants. It has an area of 2,486 Kilometre Square. The languages spoken in the Local Government Area in a hierarchical order are Kilba (Høba), Margi, Hausa, English and other minorities. Thus far, rural farmers in the area need information like other professions to carry out farming activities in order to meet their set goals. Most of the farmers live in the remote areas and to get information on farming implements and new method of farm cultivation were very difficult, due to poor road, lack of electricity, network connectivity. Furthermore, their inability to use modern tools effectively compared to other professionals found in the cities, since, not everybody can read and write well in English.

Based on the statement by the researcher, National Agricultural Extension and Research Liaison Service (NAERLS) (2018), put it clear that decision by any government to distribute improved seeds and other farm materials to farmers to boost productivity may never yield the expected results, mainly because, even with the best of technologies, farmers need quality information and knowledge to handle agricultural activities, if not so, all efforts may amount to nothing. NAERLS (2017) also added that, they set up National Farmers Helpline Centres (NFHCs) with the primary objective of providing timely and relevant information and advisory services to facilitate decisions along the agricultural value chain. Thus, these were made possible by providing farmers with sound scientific knowledge, technology and improved inputs to enhance farming productivity. NAERLS (2015) appealed to the Federal Government and Ministry of Agriculture and Rural Development to speed up the process of equipping the newly constructed National Farmers Helpline Centres (NFHCs), so that Nigerian farmers can begin to access the centre for vital information to improve and grow their farming products.

Therefore, the present government has put more efforts to diversify our economy with agriculture as the major focus. Except this move takes our agriculture out of traditional practices to a high level of mechanization and proper budgeting and actual funding and also take care of

research to generate new knowledge and rightly disseminating information generated, it may just be another failed vision (Chukwuji et al, 2019).

Statement of the Problem

The behavior of rural farmers in seeking information suggest a significant gap, as farmers express the necessity for agricultural production data to improve productivity but struggle with the availability of such information. They require guidance on the latest farming equipment, techniques for fertilizer application, knowledge about superior seeds, and access to modern agricultural technologies. However, the existing information does not seem sufficient to meet their requirements. There's a particular lack of information related to farm mechanization, storage options, and marketing strategies in the region under investigation. Addressing these information seeking behavior is critical; neglecting them may lead to a decline in food production. Consequently, it is imperative to carry out a fairly accurate assessment of the users' information seeking behavior without delay (Ode, 2017).

Based on the researcher's investigation, Hong farmers seemed like they lack appropriate information on how to boost their farming activities, in which they relied mostly on their colleagues, neighbours, past experience and forefathers who possessed traditional farming knowledge. Thus, there are evidences from low yielding of farm produce. The researcher therefore, attempts to assess information seeking behaviour with the mindset of bringing out to their notice some measures as well as ways in which they can access new modern farm tools to improve their farming production.

The investigation reveals that many farmers do not pursue current information via media outlets like television and radio, the internet, and libraries, which could potentially enhance their agricultural productivity. Is it a matter of lack of awareness? Moreover, there's a persistent drop in the farmers' interest in new information when it becomes accessible, and they frequently tend to disregard it. These farmers serve as the backbone of the food supply chain necessary for human survival. It is this context that motivates the study to evaluate the information seeking behavior of rural farmers in Hong local government area of Adamawa state, Nigeria.

Objectives of the Study

1. assess the method of information seeking behaviour of rural farmers in Hong Local Government Area,
2. determine the sources of information of rural farmers in Hong Local Government Area

Literature Review

Methods of Information-Seeking Behaviour of Rural Farmers

Recent research highlights that rural farmers employ a hybrid approach—combining interpersonal, broadcast, and digital strategies—to access agricultural information. Interpersonal methods, such as consulting extension officers, engaging with peers and family, attending demonstration plots, and participating in farmer field days, remain central to how farmers verify and interpret new

practices (Alemayehu et al., 2024). Extension practitioners themselves affirm that they prefer in-person farm visits and community forums, reinforcing the interpersonal nature of these exchanges (Makamane, Swanepoel, & Loki, 2024).

Broadcast media, especially radio programs in local languages, serve as an initial touch point. Farmers often listen to agricultural segments for general awareness and later follow up—via phone-ins or SMS—with peers or extension officers for clarification (Okon et al., 2024; Aliyu & Mohammed, 2024).

The spread of mobile phones has propelled digital and low-data methods, including calls, SMS, WhatsApp, IVR (interactive voice response), USSD, and platform-based apps. These are increasingly used for quick consultations, pest diagnostics, and market information. Digital tools boost farmers' information access, particularly when tethered to human support, though uptake depends on factors like age, literacy, and extension access (Mogashane et al., 2025; Singh et al., 2024).

A notable behaviour across contexts is triangulation: farmers cross-reference what they hear via radio or digital tools with insights from peers or extension workers, followed by on-farm trials before adopting new methods (Alemayehu et al., 2024; Makamane et al., 2024).

Determinants influencing the chosen methods include literacy, phone ownership, cooperative membership, farm size, income, and proximity to extension services. These elements particularly affect farmers' inclination toward web-based platforms or YouTube, often when supported by local advisors (Mogashane et al., 2025; Singhet al., 2024).

Information Sources of Rural Farmers

Empirical studies confirm that peer networks—including family members, neighboring farmers, and cooperative groups—constitute the most relied-upon everyday information sources, given their accessibility and trustworthiness (Alemayehu et al., 2024).

Public extension agents continue to play a pivotal role in offering tailored, plot-specific guidance. Areas with more frequent extension contact correlate with higher trust and reliance on extension advice (Makamane et al., 2024).

Radio, especially when delivered in indigenous languages, widely reaches farmers for updates on weather, pests, and prices. It fosters engagement via mechanisms like call-ins, and acts as a gateway to deeper consultation (Aliyu & Mohammed, 2024; Okon et al., 2024).

In contexts with developing value chains, agro-dealers and private advisors are frequently consulted—often even superseding public extension services—especially for inputs like seeds, fertilizers, and market intelligence (Singh et al., 2024).

Digital/mobile platforms—such as WhatsApp, YouTube, voice/SMS advisories, and mobile apps—are rapidly growing as information sources, particularly when combined with human support. However, adoption is moderated by infrastructure, affordability, and digital literacy (Wiley & Smith, 2024; Mogashane et al., 2025).

Farmer cooperatives and community organizations play a significant supporting role in collective learning and linking farmers to experts or markets (Levine & Taylor, 2024).

A recent localized study from Kwara State, Nigeria, revealed farmers prioritise access to credit, innovative methods, and marketing advice. They expressed a preference for professional associations, more extension personnel, and improved Internet services—underscoring the blended model of interpersonal, collective, and digital sources (Ibrahim, 2025).

Methodology

Survey research design was used for this study. Population of the study was made up of 200 members of Farmers' Association Groups (FAGs) in Hong Local Government Area of Adamawa State, Census sampling technique was used, because the population was manageable. A self-designed questionnaire was used as the instrument for the study. Data collected were analyzed using descriptive statistic of frequency counts, percentages and pie chart.

Data Analysis

The data collected for this study are presented in tables and analyzed using frequency counts and percentage. The presentation and analysis were based on the research question and respondents' information out of two hundred (200) questionnaire were administered in Hong Local Government Area of Adamawa State. One hundred and eighty-two 182 copies were returned. The decision Column refers to the decision made for each with respect to frequency counts, percentages and pie chart.

Results Presentation

Demographic Data of the Respondents

Table 1 Educational Qualification N=182

S/N	Qualification	Frequency	Percentage (%)
1.	Primary School Certificate	30	16.4
2.	Secondary School Certificate	50	27.5
3.	ND and NCE Certificate	60	33
4.	HND and Degree Certificate	40	22
5.	Others	2	1.1
6.	**Total**	**182**	**100**
	Farming Experience	**Frq**	**%**
1.	1-5 years	25	13.7
2.	6-10 years	20	11
3.	11-15 years	35	19.2

4.	16-20	42	23.1
5.	21 above	60	33
6.	**Total**	**182**	**100**
	Farming System	**Frq**	**%**
1.	Rainy Season Farming	119	65.4
2.	Dry Season Farming	10	5.5
3.	(Both rainy/dry season) Mixed Farming	56	30.8
4.	**Total**	**182**	**100**

Source: Field Survey, 2021

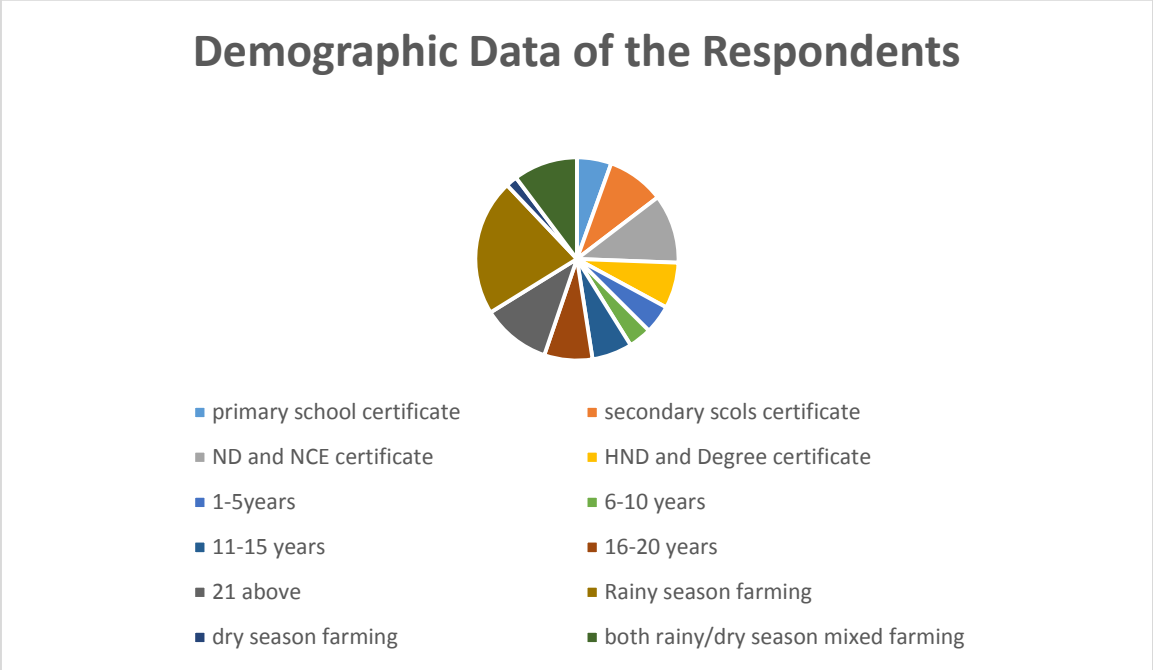


Table 1 Shows that rural farmers under study had attended school, especially those with ND and NCE were 60(33%), followed by Secondary School which were 50(27.5%), then HND and Degree 40(22%), while those with Primary School were 30(16%) and others 2(1.1%). Therefore, this implies that majority of the respondents, if not all can read and understand simple instructions because they attended formal education.

Research Question one: From where do you often seek for your information?

Table 2: Method of Information Seeking Behaviour of Rural Farmers-(N=182)

	Statement	**VO**		**O**		**NO**	
S/N		Frq	%	Frq	%	Frq	%
1.	Library catalogue	98	53.8	68	37.4	16	8.8
2.	Neighbours and colleagues	89	48.9	70	38.5	23	12.6
3.	Google	45	24.7	38	20.9	99	54.4
4.	Family, relatives and friends	46	25.3	50	27.4	86	47.3
5.	Interaction with people	32	17.6	40	22	110	60.4
6.	Newspapers and magazines	35	19.2	52	28.6	95	52.2

7.	Social media	50	27.5	48	26.4	84	46.2
8.	Internet	49	27	52	28.5	81	44.5
9.	**Total**	**444**	**244**	**418**	**229.7**	**594**	**326.4**
10.	**Average**	**56**	**30.5**	**52**	**28.7**	**74**	**40.8**

Keys: VO=Very Often, O=Often and NO=Not Often

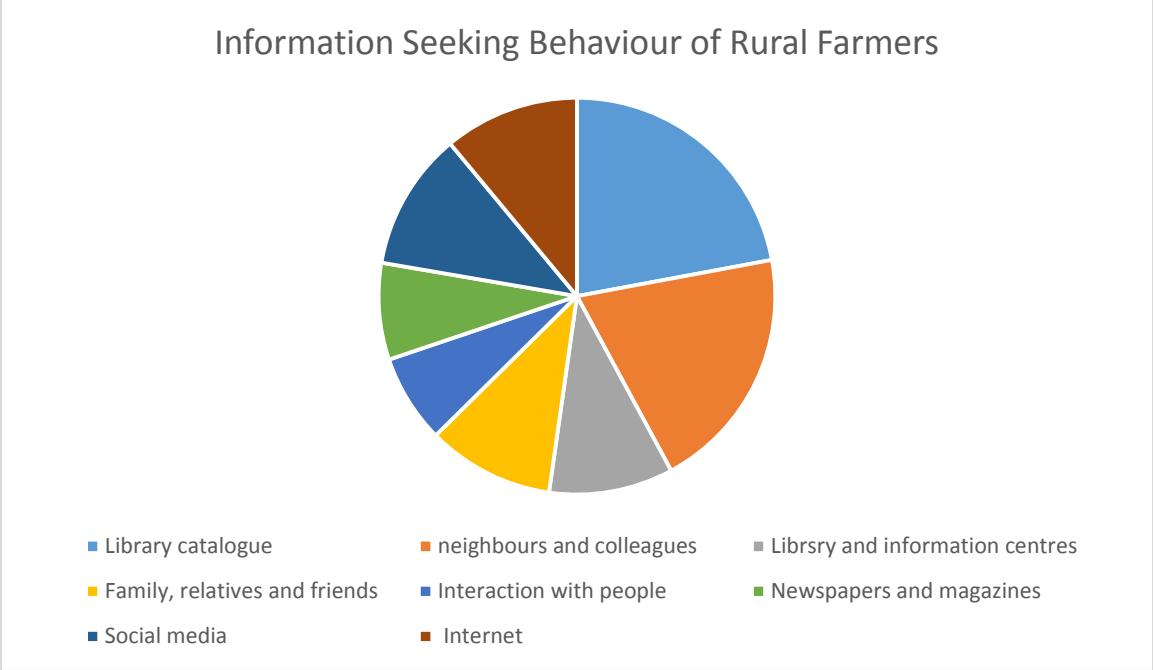


Table 1 shows the area of information seeking where majority of the respondents sought their information from family, library catalogue with 98(53.8%), seeking from neighbours and colleagues with 110(60.4%), from agricultural equipment dealers with 81(44.5%), from Family, relatives and friends with 95(52.2), from Social media with 86(47.3%), from newspapers, magazines and internet with 84(46.2%), from google with 89(48.9%) and seeking from Internet with 99(54.4%).

Respondents with 68(37.4%) indicated that they very often sought for farming information, 70(38.5%) of the respondents revealed that they often sought for farming information and then, 52(28.5%) respondents indicated that they not often seek for farming in their farming activities. Therefore, this implies that the majority of the respondents did not seek for farming information while doing their farming activities.

Research Question Two: what are the Sources of information farmers used in Hong Local Government Area, Adamawa State?

Table 2: Sources of Information Farmers Use-(N=182)

	Statement	MP		P		LP	
S/N		Frq	%	Frq	%	Frq	%
1.	Family and relatives	93	51.1	59	32.4	30	16.5
2.	Neighbours and friends	88	48.4	58	31.9	36	19.7
3.	Colleagues	111	61	49	26.9	22	12.1
4.	Past experience	115	63.2	48	26.4	19	10.4

5.	Radios and televisions	48	26.4	57	31.3	77	42.3
6.	Agriculture extension officers	97	53.3	56	30.8	29	15.9
7.	Books	68	37.4	89	48.9	25	13.7
8.	Newspapers and magazines	40	22	53	29.1	89	48.9
9.	Library and information centre	45	24.7	57	31.3	80	44
10.	Internet and cell phones	64	35.2	48	26.4	70	38.5
11.	Total	769	422.7	574	315.4	477	262
12.	Average	77	42.3	57	31.5	48	26.2

Keys: MP=Most Preferable, P=Preferable and LP=Least Preferable

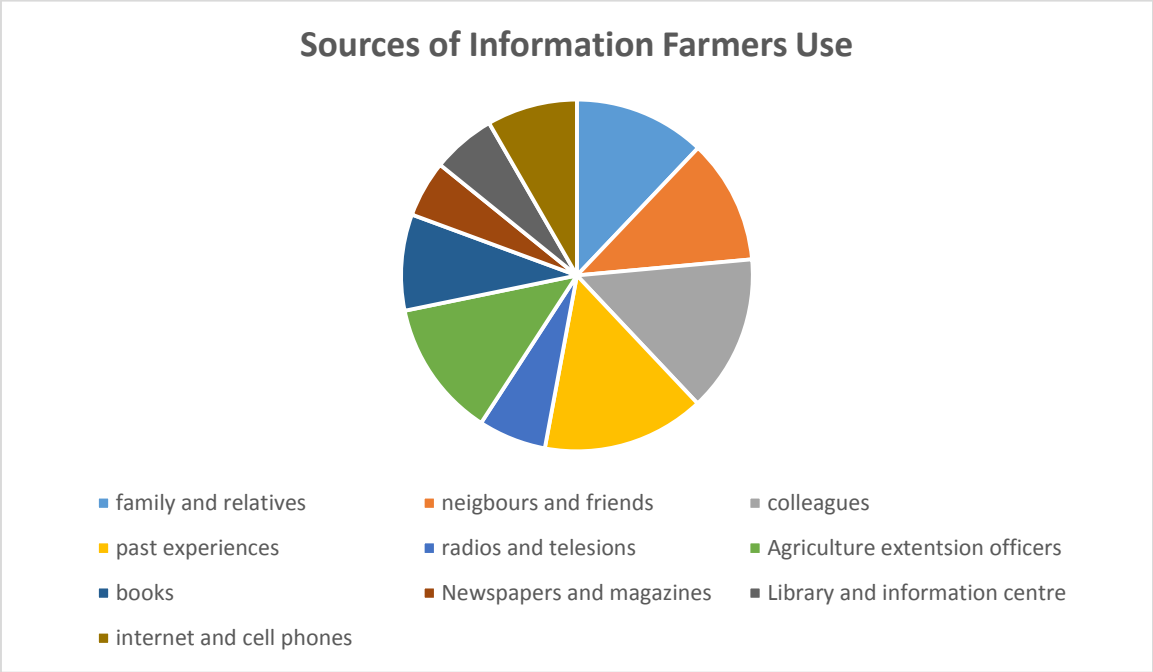


Table 2 indicates the sources of information available used by the respondents 111(61%) of the respondents sources for information from colleagues, 70(57.4) of the respondents sources for information indicated information source through radio 88(48.4%), of the respondents indicated that neighbor is another source of information used. 93(51.1%) of the respondents identified friends, family and relative as a source of information used. 97(53.2%) of the respondents stated that agricultural extension officers is another source of information., 70(38.5%) of the respondent indicated that internet and cell phones as the their source of information., 89(48.9%) of the respondents indicated books as their source of information, 77(42.3%) of the respondents indicated radio and television as their source of information, 80(44%) of the respondent indicated library and information centre as their sources of information 89(48.9%) of the respondents indicated and newspapers and magazines. Where 89(48.9%) of the respondents indicated that the sources of information were most preferable for their farming activities, 59(32.4%) respondents indicated that the sources of information were preferable to use for farming, while 89(48.9%) respondents indicated that the sources of information were least preferable for their farming activities.

Therefore, this implies that the majority of the respondents revealed that the sources of information provided to them were more preferable for their farming activities.

Discussion

Findings on information seeking revealed that the method of rural farmers seek for information from Interaction with people as well do not seek for information from library catalogues; newspapers, magazine, internet and Social media for farming. This findings of the present study disagreed with Brhane, Mammo and Negusse (2017) findings which revealed that small scale farmers prefer to seek information from colleagues, agricultural professionals, radio and cell phones to meet their needs. Also, Adebisi and Oyesola (2014) added also that most farmers consulted family, and radio and not through extension agents to meet their needs. Thus, findings of Bernard, Dulle and Honesta (2014) revealed that farmers relied solely on the family, relatives, friends and agriculture dealers for their information which are not trustworthy. The implication here is that most of respondents relied on these sources in accessing agricultural information probably because they are regularly available and accessible. The study's findings were similar to other studies like (Emmanuel, 2012); (Joseph, 2020). Therefore, the findings indicated that farmers mainly depended on informal means of information which include family, relatives, friends, colleagues and neighbours while give less regard to formal means of information such as library, information centre, newspapers, magazines and internet as their sources of information in the assessment of their information needs.

Findings on sources of information of rural farmers revealed that past experience; colleagues; neighbours, friends; family and relatives were most preferred sources of information rural farmers consulted for their farming activities. This implies that most of the respondents relied on interpersonal sources of information for accessing their information probably because of availability and accessibility. This is in line with Acheampong, Frimpong, Owusu, Asante and Asante's (2017) study where findings showed that women farmers most preferred source of information was their husbands, fellow women farmers and mass media at all the time which showed that they provided agriculture information that are credible, reliable and most often rural farmers trusted them to meet their needs.

Recommendation

Based on the findings of this study, the recommendations were highlighted as follows:

1. Government and should create an awareness for rural farmers to seek information from google, radio, television, community libraries catalogue and internet. s
2. Government should extend community libraries to rural areas under study so that farmers should have access to information resources both print and non-print such as newsletters, pictures, posters, radio broadcasting, film shows and television programmes that content information of agricultural activities and new farming implements.

Reference

Acheampong, D. A., Frimpong, N. F., Owusu A., Bright O. A. & Dulle, M. (2017). Assessing the information seeking behaviour and utilization of rice farmers in the Ejisu-Juaben municipality of Ashanti Region of Ghana. *Agric & Food Secure (2017) 6-38.*

Adebisi, A. O. &Oyesola, O. B. (2014). Information sources and awareness of climate change by citrus farmers in Benue State, Nigeria. *Journal of agricultural extension, 18(2),* 1-9

Alemayehu, T., Bekele, M., & Gebre, S. (2024). Interpersonal networks and information verification practices of smallholder farmers. Agriculture and Human Values, 41(2), 301-315. https://doi.org/10.1007/s10460-023-10523-6

Aliyu, A. A., & Mohammed, I. (2024). The role of local language radio in agricultural information dissemination among rural farmers. Journal of Agricultural Communication, 12(3), 45-59.

Benard, R., Dulle, F. &Honesta, N. (2014). Assessment of information needs of rice farmers in Tanzania: A case study of Kilombero District, Morogoro. *Library Philosophy and Practice (e-journal), 1071.* Available at http://digitalcommons.unl.edu/libphilprac/1071

Brhane, G., Mammo, Y. &Negusse, G. (2017). Sources of information and information seeking behaviour of smallholder farmers of TanqaAbelleWereda, Central Zone of Tigray, Ethiopia. *Journal Agriculture Extension Rural Development, 9(4), 47-52.*

Chukwuji, C. N.; Tsafe, A. G.; Sule, S.,Yusuf, Z.; &Zakariya, J. (2019), "Awareness, Access and Utilization of Information on Climate Change by Farmers in Zamfara State, Nigeria" . *Library Philosophy and Practice (ejournal)*. 2106.

Demet, S., Nilay, C. & Marco, S. (2016). A comparative study of information seeking behaviour and digital information needs of farmers in Turkey and Sweden. *International Journal of e-Business and e-Government, 8(2),* 2146-0744.

Demet, S., Nilay, C. & Marco, S. (2016). A comparative study of information seeking behaviour and digital information needs of farmers in Turkey and Sweden. *International Journal of e-Business and e-Government, 8(2),* 2146-0744.

Demet, S., Nilay, C. & Marco, S. (2016). Acomparative study of information seeking behaviour and digital information needs of farmers in Turkey and Sweden. *International Journal of e-Business and e-Government, 8(2),* 2146-0744.

Emmanuel, H. (2012). *Information Needs and Information Seeking Behaviour of rural farmers in Okpokwu Local Government area of Benue State of Nigeria.* Unpublished master thesis, University of Nigeria, Nsukka, 1-98

Habtemariam A., Tegegni, G.E. &Azage, T. (2015). Agricultural knowledge management: The case of cattle feed quality improvement in Bure district west Gojjam, Ethiopia. *Journal ofAgricultural Extension and Rural Development, 7(1), 1-7.* http://digitalcommons.unl.edu/libphilprac/2106

Ibrahim, O. (2025). Information needs and source preferences of farmers in Kwara State, Nigeria [Unpublished master's thesis]. University of Ilorin.

Joseph, L. (2020). Information and information seeking behaviour of farmers for sustainable agricultural development in Benue State, Nigeria. *International of Research and Innovation in Social Science,* 4(4), 2454-6186.

Joseph, L. (2020). Information and information seeking behaviour of farmers for sustainable agricultural development in Benue State, Nigeria. *International of Research and Innovation in Social Science,* 4(4), 2454-6186

Kabir, K.H., Roy, D., Sarker, A. & Kuri, S.K.(2014). Information seeking behaviour of the farmers to ensure sustainable agriculture. *European Academic Research, II* (3), 3723–3734.

Kughur, P.G., Daudu, S. & Akua, E.M. (2014). Different sources of information on adoption behaviour offarmers in Logo local area Government of Benue State, Nigeria. *Asian Journal of Biological and Life Sciences,* 3(2),133–136.

Levine, R., & Taylor, K. (2024). The role of collective action: How cooperatives facilitate learning and market access for rural farmers. World Development, 174, 106441. https://doi.org/10.1016/j.worlddev.2023.106441

Makamane, P., Swanepoel, J. W., & Loki, O. (2024). Extension officer perspectives on preferred farmer engagement strategies in sub-Saharan Africa. Journal of Rural Studies, 105, 103189. https://doi.org/10.1016/j.jrurstud.2023.103189

Mogashane, L., Ledwaba, T., & Van der Haar, D. (2025). Determinants of digital agricultural platform adoption among small-scale farmers in South Africa. Technology in Society, 72, 102185. https://doi.org/10.1016/j.techsoc.2025.102185

National Agricultural Extension and Research Liaison Service (2015*). A quarterly newsletter of the NAERLS, FMARD ABU, Zaria, 4(1), 7.*

National Agricultural Extension and Research Liaison Service (2018). *Agricultural Performance Survey Report, from monthly Digest 7(2), 3.*

National Agricultural Extension and Research Liaison Service (2017). *NAERLS has the capacity to turn around Nigeria's Agriculture: Monthly Digest, (3), 2.*

Ode, o.E (2017). Information seeking of rural famer in Ameka-Owo in Oju local government area of Benue state, 9(2), 63-72

Okon, U. E., Akpan, S. B., & Edet, J. U. (2024). Integrating broadcast media and mobile technology for sustainable agricultural advisory services. Food Security, 16(1), 145-160. https://doi.org/10.1007/s12571-023-01415-w

Prajapali, B. H. (2015). *Library and information science*. Discovery publication house, Ansari Road, Darya Ganj; New Delhi, 7-8.

Rabiu, A. M. (2014). Librarian's perception of evidence based library and information practice (EBLIB) and information society as vital tool for national development. *Journal of Applied Information Science and Technology, 9(1),* 63-72.

Sharm, B. (2018). *Concept, definitions and types of farming system*. Kathmandu, Nepal, 1-43.

Singh, P., Kumar, A., & Patel, R. (2024). Changing dynamics of agricultural information sources: The rising influence of agro-input dealers in rural India. The Journal of Agricultural Education and Extension, 30(4), 487-503. https://doi.org/10.1080/1389224X.2024.2314567

Wiley, J., & Smith, M. L. (2024). Bridging the digital divide: Human-mediated mobile learning for low-literacy farmers. Information Technologies & International Development, 20, 1–18.

Yusuf, T. I. (2012). "Information Needs, Sources and Information Seeking Behaviour of Women Artisans in Offa Metropolis". *Library Philosophy and Practice (e-journal)*. 1201. http://digitalcommons.unl.edu/libphilprac/1201

INFLUENCE OF PROFESSIONAL COMPETENCE ON JOB PERFORMANCE OF MEDICAL LIBRARIANS IN HEALTH INSTITUTIONS IN SOUTHERN NIGERIA

Vincent E. Unegbu
Babcock University, Ogun State, Nigeria

Owolabi, R. O
Babcock University, Ogun State, Nigeria

Juliana Patrick Michael
Babcock University, Ogun State, Nigeria

Abstract

Professional competence is essential for job performance. Investing in professional development can lead to improved job performance and career advancement. Therefore, this study investigated the influence of professional competence on the job performance of medical librarians in health institutions in Southern Nigeria. The study adopted a survey design and a purposive sampling technique. The population of the study comprised all the two hundred and forty-eight (248) medical librarians in health institutions in Southern Nigeria. Data was collected using a validated structured questionnaire. The data were analyzed using descriptive statistics, simple linear and multiple regression. The findings revealed that the level of professional competence of medical librarians in health institutions in Southern Nigeria was high. Findings also revealed that all dimensions of professional competence; Knowledge, and Skill positively and significantly influenced job performance. The study outcome highlighted the critical role of professional competence as a key factor in enhancing job performance. Therefore, the study concluded that professional competence enhanced job performance of medical librarians in health institutions in Southern Nigeria. Based on the findings, the study recommended that the library management of the health institutions in Southern Nigeria should prioritize continuous training and development opportunities that will focus on expanding the knowledge base of medical librarians, particularly in the areas on how to conduct systematic reviews and meta-analysis, and emerging health information technologies. Strengthening knowledge in this area would further enhance the librarians' ability to meet the evolving needs of healthcare professionals and patients.

Keyword: Professional competence, job performance, influence, health institutions, medical librarians, Southern Nigeria.

Introduction

Job performance refers to how effectively and efficiently employees fulfill their job responsibilities. It includes individual output, goal achievement, teamwork, and adherence to rules. Scholars such as Adedayo et al. (2022), and Şahin & Kanbur (2022) highlighted that performance is not only about outcomes but also about the behaviors and attitudes employees' exhibit in the workplace. Campbell et al. (1993) defined it as observable behavior that generates value for the

organization. Strong job performance enhances productivity and drives business expansion, while also benefiting employees through promotions, salary increases, and career advancement opportunities. As a key measure of organizational efficiency, job performance is crucial in all sectors, including libraries. The job performance of medical library professionals is vital to the success of healthcare organizations, ensuring the accessibility and effective use of information resources that support patient care, research, and education. Medical libraries serve as essential repositories of scientific information, designed to help healthcare professionals, access reliable and up-to-date health and biomedical literature critical for informed clinical practice and research. In response to the rapidly evolving information landscape and technological advancements, medical librarians must continually develop a broad and adaptable skill set to meet changing professional demands, while delivering high-quality, user-centered services that address the information needs of healthcare practitioners and patients. As highlighted by Abotalebi and Biglu (2017), the development of knowledge and skills is essential for medical librarians to excel in their roles and deliver high-quality services.

Professional competency is crucial for enhancing job performance and delivering high-quality services especially in medical librarianship. Akande et al. (2016) sees professional competencies as the attitudes and behavior designs that support how people do their work. Singh and Kumar (2020) captured professional competence as a group of unified abilities, attitudes, commitments, knowledge and other definite attributes of personalities or groups of personalities indispensable in a particular job environment. Professional competence in librarianship, is concerned with the librarians' understanding of information assets, access, ICTs, management as well as the capability to apply it as a base for giving the maximum excellence information services (Fernandez & Buenrostro, 2015).

In this study, the construct of knowledge and skills was employed as a measure of professional competence because they are regarded as the fundamental and essential technical competencies. Knowledge is the awareness, understanding or familiarity gained through experience, education, or study. Skills refer to the proficiency or expertness that arises from training and practice, encompassing both hard and soft skills. In librarianship, knowledge process necessitates the use of appropriate technology to obtain necessary knowledge from a variety of

sources both in and out of institutions (Ajiboye at al., 2022). Medical librarians who possess professional competence are well-positioned to navigate the dynamic landscape of healthcare information. The effectiveness of medical librarians in supporting evidence-based healthcare largely depends on their professional competence and access to continuous development opportunities. In Southern Nigeria, these competencies remain underexplored, particularly in relation to job performance. While medical librarians are recognized for their role in supporting clinical decision-making, evidence-based practice, and research, there is limited documentation on the extent to which they possess and apply essential competencies. **Professional competence** is recognized as a vital tool for career growth and effective job performance. The absence of professional competence often results in poor performance, impede timely access to reliable health information, reduced productivity, diminished confidence, and potential harm to individuals, organizations, and the communities they serve. Given this context, the present study investigates the impact of professional competence on the job performance of medical librarians in health institutions in Southern Nigeria.

Statement of the Problem

Professional competence is essential for medical librarians, enhancing job performance, productivity, and quality, while supporting evidence-based practice and contributing to improved patient care and healthcare outcomes. In medical library practice, professional competence entails maintaining and developing a comprehensive and up-to-date knowledge base through diverse networks and resources (Medical Library Association, 2007).

Despite the comprehensive competencies outlined by the Medical Library Association (MLA), there remains a notable gap in the consistent application and recognition of these skills within many medical library settings. Popoola et al. (2020) revealed that Nigerian medical librarians primarily rely on foundational knowledge, indicating that their services are in a developmental stage. The study of Urhefe-Okotie and Ojeabulu (2023), and Solanke et al. (2023) revealed that the extent of job performance of librarians is considerably low. The perceived suboptimal job performance of librarians in Nigerian libraries may be attributed to persistent

reliance on traditional service delivery methods, and inadequate professional competence, which have often raised critical concerns.

Objectives of the study

The specific objective is to:

1. ascertain the level of professional competence of medical librarians in health institutions in Southern Nigeria.
2. determine the influence of professional competence on job performance of medical librarians in health institutions in Southern Nigeria;

Hypothesis

$H0_1$: Professional competence have no significant influence on job performance of medical librarians in health institutions in Southern Nigeria.

Literature Review

Professional competence refers to the knowledge, skills, attitudes, and behaviors that enable individuals to perform their job roles effectively and ethically. According to Epstein and Hundert (2002), professional competence involves the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served. In medical libraries, competency is required to develop specialized information services. Competencies can be seen as the expertise of staff to apply understanding, aptitudes, and abilities needed to effectively perform critical labour functions or jobs in a certain work situation (Sani & Musa, 2019). Fahrenbach et al. (2019) gave three distinctive views on the concept of professional competence: First, professional competence can be seen as a body of applied scientific knowledge, second is the tacit dimension of professional competence. Thirdly, professional competence has been conceptualized as consisting of Knowledge, Skills, Abilities, and other attributes (KSAOs). Medical Library Association (2017) declared librarians' professional competencies as observable, measurable, and acquirable necessary skills and abilities. Similarly, Kaur and Sharma (2018) relates professional competence to the special librarian's knowledge in the areas of information resources, information access, technology, management and research and the ability to use these areas of knowledge as a basis

for providing library and information services. Garba and Madukoma (2022) recorded librarians' competencies as all the necessary knowledge, insolence, and abilities needed to practice as a librarian or information specialist in different organizations, to provide a multiplicity of value - added, modified and higher quality services in the library.

Studies have been conducted among different professionals including librarians to ascertain the influence of professional competencies on job performance, and the outcome yielded varying results. Oguntayo et al. (2023) investigated the professional competence and job satisfaction of librarians in private university libraries in South-West, Nigeria. The study employed survey research design and the total population for the study was one hundred and sixty-seven (167) librarians. A structured questionnaire was used for the data collection. The finding shows that generally the librarians in the private university libraries in South -West, Nigeria possessed professional competence on the job. Garba and Madukoma (2022) investigated the influence of librarian's professional competencies on work engagement in federal universities in North West, Nigeria. The study used survey research design. The population of study comprised three hundred and thirty-two librarians in federal universities in North West, Nigeria. The findings revealed that the librarians possess high level of competencies in areas of knowledge and skills.

Osiesi, et al. (2022) evaluated the impact of professional training and development for librarians/library staff in federal university of Oye, Ekiti, Southwest Nigeria. The study outcome showed that there is a positive and statistically significant relationship between the professional development of library staff and their performance in the job. Idhalama et al. (2020) studied the competencies of librarians as a factor affecting information service delivery in Delta State. The study used descriptive survey design and a total of sixty-one librarians were the population of the study. The study used questionnaire as the instrument for data. The findings of study showed that the majority of the respondents possess high extent of the ICT skills, high extent of customer-service competency, and most librarians possess high extent of competency in interpersonal communication. Oyeniran and Akphorhonor (2019) assessed the influence of demographic factors of librarians on job performance in the university libraries in South West, Nigeria. The used employed expo- facto research design survey. The sample size was two hundred and sixty

librarians. Self-designed structured questionnaire was used for the data collection. The findings established that age, gender and work experience significantly influenced job performance of librarians in the university libraries in Nigeria.

Anwar and Zhiwei (2019) find out the skills and knowledge of academic librarians in the age of electronic. The study used qualitative research design. Survey method was used to collect the relevant data through literature retrieved from Google and Google scholar, wikis and other sources of internet. The findings showed that the LIS professionals still lacking some of the major skills, competencies, and knowledge regarding the future concern of library organization. Ullah and Anwar (2013) identified competencies needed for medical librarians in Pakistan. The population of this study comprised of head librarians working in academic and research medical libraries with at least three years of experience of medical librarianship. Two different questionnaires were used for the data collections. The outcome of the study revealed that medical librarians in Pakistan generally lack specialized training in medical librarianship. Therefore, the knowledge of the needed competencies seems limited.

The literature on professional competence emphasizes its critical role in improving job performance, especially in fields like Library and Information Science (LIS). Core competencies such as digital literacy, research skills, and interpersonal communication are essential for effective service delivery and career advancement. Similarly, institutional support and continuous professional development are key factors in maintaining and enhancing competence. However, a significant gap exists in studies examining how professional competence is developed and supported within health institutions in Nigeria, particularly for medical librarians. Addressing this gap could significantly enhance the professional competence of medical librarians, leading to better career progression and the overall improvement of healthcare library services.

Methodology

This study adopted a survey research design of the cross-sectional type. The study employed purposive sampling technique, and the population comprised all the two hundred and forty-eight (248) medical librarians (professionals and paraprofessionals) working in university teaching hospitals, federal specialist hospitals, and federal medical centers in all the States in Southern Nigeria. Total enumeration was used to include all the medical librarians for the study. The data was collected using a questionnaire designed. The reliability of the instrument was tested using Cronbach's Alpha, yielding a coefficient of 0.97, indicating excellent reliability. The data was analyzed using Statistical Package for Social Sciences (SPSS) software, version 23. Descriptive statistics including frequency counts, percentage, mean, and standard deviations were used to analyze the data. Inferential statistics (simple and multiple linear regression) was used to test the hypotheses at a 5% significance level ($\alpha = 0.05$).

Results and Discussion of Findings

A total of two hundred and forty-eight (248) copies of the questionnaire were distributed to the respondents; but only 230 copies were appropriately filled and validated for analysis, indicating a 92.7% response rate. This indicates that the response is high and good for the analysis.

Table 1: Demographic Characteristics of Respondents

Characteristics	Classification	Frequency	Percentage (%)
Gender	Male	108	47
	Female	122	53
Total		**230**	**100.0**
Age	18 -24	2	0.9
	25-34	33	14.3
	35-44	74	32.2
	45-54	80	34.8
	55-64	41	17.8
Total		**230**	**100.0**
Work experience	1-5yrs	28	12.2
	6-10yrs	38	16.5
	11-15yrs	73	31.7
	16-20yrs	36	15.7
	21yrs & above	55	23.9
Total		**230**	**100.0**

Highest educational qualifications	MSC/MLA/MLIS/MHIM	94	40.9
	PGD	7	3.0
	MPHIL	9	3.9
	PHD	33	14.3
	BA/BSC/BLS	71	30.9
	Others (OND, HND)	16	6.9
Total		**230**	**100.0**
Respondents' designation	University Librarian	6	2.6
	Deputy Librarian	21	9.1
	Principal Librarian	38	16.5
	Senior Librarian	49	21.3
	Librarian 1	35	15.2
	Librarian II	18	7.8
	Chief Librarian	3	1.3
	Assistant Librarian	21	9.1
	Others (Senior Library officer, Library Officer, Principal Library Officer, Assistant Chief Librarian, Assistant Director Library services)	39	16.9
Total		**230**	**100.0**

Source: Researcher's field work, 2025

Table 1 shows the demographic information of the participants of the study. The result revealed that there were 108 (47%) male and 122 (53%) female participants. This suggests that the respondents are fairly evenly distributed, with a slightly higher percentage of females. The age range of the respondents also shows that 80 (34.8%) were between 45 -54 years old, 74 (32.2%) were 35-44 years, 41 (17.8%) were 55-64 years old, and 2(0.9) were 18-24 years old. This result indicates that the majority of respondents are in their prime working years, suggesting a workforce with significant experience and expertise.

On work experience, 73 (31.7%) have work experience of 11-15 years, 55 (23.9%) have more than 21 years' work experience, and 38 (16.5%) have worked for 6-10 years. This suggests that the respondents of the study are primarily composed of experienced professionals with substantial tenure in the field, likely contributing valuable expertise and insights to their responses. On the highest educational qualification, the results showed that most of the respondents 94 (40.9%) were holders of MSC/MLA/MLIS/MHIM. Seventy-one (30.9%) were holders of BA/BSC/BLS, 33(14.3%) had PhDs, Others (OND, HND) were 16(6.9%), 9(3.9%) MPhil, while 7(3.0%) were PGD. This suggests a knowledgeable and qualified workforce.

On respondents' designation, the majority of the respondents, 49(21.3%) were senior librarians, followed by "Others" 39 (16.9%) [Senior library officer, library officer, principal library officer, assistant chief librarian, assistant chief medical librarian, assistant director library services, computer analyst], principal librarians 38(16.5%), librarian I 35(15.2%), assistant librarian 21(9.1%), librarian II 18(7.8%), 6(2.6%) university librarian, 3(1.3%), and the lowest category were 3(1.3%). The overall distribution suggests that a large number of the respondents occupy senior roles, with the "Others" category representing various specialized positions, which could be attributed to different nomenclature used to categorize librarians in Ministries, Department, and Agencies (MDA) and other health institutions.

Table 2: Level of Professional Competence of Medical Librarians in Health Institutions in Southern Nigeria

Professional Competence	Very High Level (%)	High Level (%)	Low Level (%)	Very Low Level (%)	Mean	SD
Skills					**3.30**	**.689**
My ability to communicate effectively to diverse patrons is	104(45.2)	111(48.3)	10(4.3)	5(2.2)	3.37	.672
My ability to work collaboratively with health professionals is…	98(42.6)	113(49.1)	15(6.5)	4(1.7)	3.33	.676
My ability to critically manage health information is…	104(45.2)	95(41.3)	29(12.6)	2(.9)	3.31	.721
The extent to which I can deliver ethically in the library is…	102(44.3)	101(43.9)	24(10.4)	3(1.3)	3.31	.710
My ability to take initiatives in a rapidly changing environment is…	95(41.3)	109(47.4)	23(10)	3(1.3)	3.29	.696
My ability to adapt to emerging technologies to deliver in the library is…	85(37)	123(53.5)	20(8.7)	2(.9)	3.27	.650
My ability to teach health professionals on how to access health information is…	88(38.3)	110(47.8)	30(13)	2(.9)	3.23	.703
Knowledge					**3.16**	**.712**
My expertise to disseminate relevant information for varying library patrons…	103(44.8)	106(46.1)	19(8.3)	2(.9)	3.35	.668
The extent to which I can determine the information needs of library patrons is…	96(41.7)	116(50.4)	17(7.4)	1(.4)	3.33	.631
My awareness of various information resources in various formats is…	98(42.6)	105(45.7)	25(10.9)	2(.9)	3.30	.694
My ability to understand the principles of data privacy as a medical librarian…	86(37.4)	108(47)	35(15.2)	1(.4)	3.21	.707
My ability to understand health informatics is…	80(34.8)	114(49.6)	34(14.8)	2(.9)	3.18	.707

My ability to familiarize with biomedical databases, Pubmed, Embase, and Cochrane is…	68(29.6)	125(54.3)	33(14.3)	4(1.7)	3.12	.705
My ability to understand the principles of evidence -based medicine (medical research) is…	76(33)	107(46.5)	40(17.4)	7(3)	3.10	.787
My ability to understand medical terminology is…	68(29.6)	116(50.4)	45(19.6)	1(.4)	3.09	.709
My ability to conduct systematic review is…	51(22.2)	127(55.2)	45(19.6)	7(3)	2.97	.735
My ability to conduct meta-analysis is…	53(23)	107(46.5)	64(27.8)	5(2.6)	2.90	.778
Overall mean					**3.22**	**.703**

Source: Researcher's field work, 2025

Decision rule: if mean is 1-1.74 = Very low, 1.75-2.49= Low, 2.5-3.24= High, 3.25-4.00=Very high

Table 2 shows respondents' view on their level of professional competence. The result showed that the level of professional competence of medical librarians was high (*M*= 3.22) on a four-point Likert scale. This means that librarians have a good mastery of what is required to be a professional librarian. However, there is room for improvement as the scale was not exceeded. The result further revealed that the level of skill was very high (*M*=3.30), in which the respondents indicated that their ability to communicate effectively to diverse patrons was very high (*M* = 3.37) as well as their ability to work collaboratively with health professionals (*M*= 3.33). They also indicated that their ability to critically manage health information (*M* =3.31), and the extent to which they can deliver ethically in the library (*M* =3.31) were very high. Level of knowledge was also found to be high (*M* =3.16), in which the respondents indicated that their expertise to disseminate relevant information for varying library patrons was very high (*M* = 3.35) as well as the extent to which they can determine the information needs of library patrons (*M* = 3.33). Overall, this result suggests that while medical librarians are performing well across several key areas, there is still potential for improvement, particularly in the area of knowledge, which is one of core competencies needed for their job. This area is crucial for their job, and there may be opportunities to go beyond the current standards.

The findings revealed that the level of professional competence of medical librarians in health institutions in Southern Nigeria was high (*M*= 3.22) on a four-point Likert scale. This outcome showed that the medical librarians claimed to possess the necessary skills required for their roles within the healthcare system. High professional competence may be attributed to factors

such as proper training, ongoing professional development, and access to relevant resources and technology. This finding is in tandem with the previous study conducted by Garba and Madukoma (2022), Oguntayo et al. (2023). Garba and Madukoma (2022) investigated the influence of librarians' professional competencies on work engagement in federal universities in North West, Nigeria, and their outcome revealed that the librarians possess a high level of competencies in areas of knowledge and skills. Oguntayo et al. (2023) examined the professional competence and job satisfaction of librarians in private university libraries in South-West, Nigeria. The finding shows that the respondents possessed professional competence on the job. Idhalama et al. (2020) studied the competencies of librarians as a factor affecting information service delivery in Delta State. The findings of the study also showed that the majority of the respondents possess a high extent of ICT skills and a high extent of customer-service competency. However, this outcome is in contrast to the finding of Anwar and Zhiwei (2019) that library and information science professionals are still lacking some of the major skills, competencies, and knowledge regarding the future concern of library organization. Following the above outcome, it is crucial to gain ample understanding of the dimensions of professional competence, particularly in relation to the respondent's skills and knowledge.

The findings of the study showed that the respondents' skill levels (M=3.30) were rated higher than their knowledge levels (M=3.16) on a four-point Likert scale, despite both receiving significant average scores. This suggests that there is still potential for growth, particularly in the area of knowledge. The level of skill set among medical librarians in health institutions in Southern Nigeria was demonstrated in areas such as communication ability, collaboration, ethical management of health information, taking initiatives, and adapting to emerging technologies to deliver library service. This outcome is significant because medical librarians play a critical role in supporting healthcare professionals by managing information resources. Their high level of expertise can contribute to improved patient care, enhanced research quality, and more effective decision-making processes within healthcare institutions. Another major finding of this study is that the level of knowledge among medical librarians in health institutions in Southern Nigeria was found to be high (M= 3.16), although it ranked lower when compared to their skill levels (M = 3.16) on a four-point Likert scale. This suggests there is still room for growth, especially in the

area of knowledge. This outcome indicates that, in general, medical librarians in the region possess a strong understanding of their roles and responsibilities within healthcare settings. However, while they are well-informed, there seem to be gaps or challenges in the practical application of their knowledge. This gap implies that while these librarians are fulfilling their core responsibilities effectively, they may not be keeping pace with emerging trends, or technologies in the field. Such a lack of awareness could limit their ability to integrate modern tools and techniques that could enhance their roles and improve the services they provide to health professionals and patients alike. This outcome supported the finding of Ullah, Ameen and Bakhtar (2011), whose findings revealed that the medical librarians were generally involved in traditional kinds of professional activities.

Hypothesis One: Professional competence has no significant influence on job performance of medical librarians in health institutions in Southern Nigeria.

Table 3: Influence of Professional Competence on Job Performance

Variables	***B***	***Std Error***	***Beta***	***t***	***Sig***	***Adj.R^2***	***F***	***ANOVA Sig***
(Constant)	32.958	3.694		8.921	.000	0.595	169.43 (2,227)	.000
Knowledge	1.327	.173	.509	7.652	.000			
Skill	1.088	.234	.309	4.649	.000			

Dependent Variable: Job Performance

Source: Researcher's field work, 2025

The result on the influence of professional competence on the job performance of medical librarians was presented on Table 3. The result revealed that professional competence (*Adj.* R^2 = 0.595, F (2, 227) = 169.43, p <.05) had significant influence on job performance of medical librarians. This implied that professional competence was responsible for about 59.5% changes in the job performance of medical librarians. On the relative influence, the result further revealed that knowledge (β = 509. t (230) =7.652, p < .05) accounted for about 50.9% of the changes in job performance, while skill (β = .309, t (227) = 4.649, p < .05) was responsible for 30.9% of the variations in medical librarians' job performance. Therefore, the null hypothesis is rejected and

restated thus: professional competence has a significant influence on job performance of medical librarians in health institutions in Southern Nigeria.

The findings showed that professional competence had a significant influence on the job performance of medical librarians. This outcome substantiates the findings of Osiesi et al. (2022), who found a positive and statistically significant relationship between the professional development of library staff and their performance in the job. The result of this present study underscores the critical role that the medical librarians' skills and expertise play in their ability to effectively perform their roles. From the hypothesis tested on the relative influence, results of the findings indicate that knowledge has a greater impact on the job performance than skills of medical librarians in health institutions in Southern Nigeria. The results also suggest that **knowledge** and **skills** are key drivers of job performance, with knowledge accounting for a larger share of the influence. This outcome supported the statement of Anwar and Zhiwei (2019), who asserted that library and information professionals need to acquire new skills and knowledge to make their libraries on library users' thumbs. The findings also supported the study of Idhalama, AIyebelehin, and Okobo (2020), which reported that the majority of their respondents possess a high extent of ICT skills and high extent of customer-service competency.

Conclusion and Recommendations

The study has highlighted the critical role that professional competence plays in the job performance of medical librarians in health institutions in Southern Nigeria. The result of the study revealed that professional competence had a significant influence on the job performance of medical librarians. As a result, it can be concluded that professional competence is a key factor in enhancing the job performance of medical librarians in health institutions in Southern Nigeria. The development of key professional skills contributes to enhanced job performance, enabling medical librarians to better support healthcare professionals and improve the quality of services provided. This underscores the importance of investing in the professional growth of medical librarians to optimize their roles within the healthcare system.

Following the outcome of the study, the library management should prioritize continuous training and development opportunities. These programs should focus on expanding the knowledge base of medical librarians. Strengthening knowledge particularly in areas on how to conduct systematic reviews and meta-analysis, emerging health information technologies, and evolving healthcare practices will further enhance the librarians' ability to meet the evolving needs of healthcare professionals and patients.

References

Abotalebi, P., & Biglu, M.H. (2017). Identification of competencies for professional staff of academic medical libraries in Iran. *Open Access Library Journal, 4*(6), 1-13. https://doi.org/10.4236/oalib.110365

Adedayo, E. A., Obinna, J. O., Ikpoko-Ore-Ebirien, D.I. & Kayode, W. (2022). Influence of information flow and employees' job performance in Federal Inland Revenue service, Lagos State, Nigeria. *International journal of social sciences human review, 12 (1),* 252-262.

Ajiboye, O. O., Aramide, O. O., & Oketunji, I. (2022). Knowledge acquisition in South-West Nigeria. *Intergrity journal of education and training, 6*(5), 101-105.

Akande, T. A., Orim, T. U., & Olaniyi, O. T. (2016) Facilitating the move to competency -based staffing in academic and research libraries in the globalised era. *Samaru Journal of Information Studies, 16*(1), 100 – 116.

Anwar, M. & Zhiwei, T**.** (2019). Skills, knowledge and competencies for future librarians: A review paper. *International Journal of Technical Research & Science,* 4(10), 22- 25.

Campbell, J. P (1990), McCloy, R. A., Oppler, S. H. & Sager, C. E. (1993). A theory of performance, in C. W. Schmitt & W. C. A. Borman (eds), *Personnel Selection in Organizations*. San Francisco: JosseyBass, 35-70.

Epstein, R. M., & Hundert, E. M. (2002). Defining and assessing professional competence. *JAMA, 287*(2), 226–235. https://doi.org/10.1001/jama.287.2.226

Fahrenbach, F., Kaiser, A., Kragulj, F. & Kerschbaum, C. (2019). Designing a tool to assess professional competences: Theoretical foundations and potential applications; *proceedings of the 20th European Conference on Knowledge Management ECKM 2019*.

Fernandez, L. M. & Buenrostro Jr, J. C. (2015). Competencies of professional librarians in northern Luzon, Philippines: Basis for building capacities and continuing professional development. *The Congress of Southeast Asian Librarians (CONSAL). 15*, 123 – 129.

Garba, A. & Madukoma, E. (2022). Librarian's professional competencies and work engagement in federal universities in North-West, Nigeria. *Global Journal of Applied, Management and Social Sciences, 24*: 20 – 32.

Idhalama, O. U., AIyebelehin, A. J. & Okobo, O. (2020). Competencies of librarians as a factor affecting information, service delivery in selected university libraries in Delta State, Nigeria. *International Journal on Integrated Education, 3*(10), 92-102.

Kaur, R. & Sharma, A. K. (2018). 21st Century library professionals in dynamic role in digital era. *Library Progress (International), 38* (1).

Medical Library Association. (2007). Competencies for lifelong learning and professional success: The educational policy statement of the Medical Library Association. https://www.mlanet.org/wp-content/uploads/2024/07/MLA-Professional-Competencies-2007- Full-Report.pdf

Oguntayo, S, A., Unegbu, V. E. & Alegbeleye, G. O. (2023). Analysis of professional competencies and job satisfaction of librarians in private universities in South-West, Nigeria. *FUDMA Journal of Sciences, 7*(6), 382-390.

Osiesi, M. P., Odobe, V. T., Sanni, K. T., Adams, A. B., Oke, C. C., Omokhabi, U. S. & Okorie, N. C. (2022). An assessment of the impact of professional development and training on job performance of library staff in Federal University Oye Ekiti libraries, Nigeria. *Library Management, 43*(3/4), 228-239.

Oyeniran, K.O. & Akphorhonor, B. A. (2019). Assessment of the influence of demographic factors on job performance of librarians in university libraries in South-West, Nigeria. *Research Journal of Library and Information Science, 3*(2), 13-19.

Popoola, B.O., uzoaba, N.C. & Rabiu, N. (2020). What's happening over there? : A study of the current state of services, challenges, and prospects in Nigeria Medical Libraries. *Journal of Medical Library Association,* 108(3), 398-407.

Şahin, E. T. & Kanbur, A. (2022). Presenteeism in healthcare professionals and its effect on job performance (contextual performance / task performance). *J Nurosology, 25*(1), 7-13.

Sani, O. J. & Musa, A. (2019). Influence of ICT competencies on job performance among library personnel in tertiary institutions in Lokoja, Kogi State, Nigeria. *Samaru Journal of Information Studies, 19*(1), 62-76.

Solanke, P. A., Akinsanya, A. O., & Kuye, O. O. (2023). Work environment and job performance of library personnel in universities: A literature review. Moshood Abiola Polytechnic *Journal of Women in Technical Education & Employment, 1*(1).

Ullah, M., Ameen, K. & Bakhtar, S. (2011). Professional activities, needed competencies and training needs of medical librarians in Pakistan. *Education for Information, 28*(2-4), 115-123

Urhefe-Okotie, E, A., & Ojeabulu, N. (2023). Library services as determinants of job performance of librarians in federal universities in south-South, Nigeria. *Lafia journal of library and information science, 3*(1), 177-191.

CHALLENGES AND OPPORTUNITIES OF IMPLEMENTING ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN NIGERIAN LIBRARIES

Fidelia Mbowheing WHONG
Ahmadu Bello University, Zaria

Abstract

The integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies into Nigerian libraries holds immense transformative potential, yet it is accompanied by considerable challenges. This paper investigates the key obstacles hindering the adoption of AI and ML within the Nigerian library system, including inadequate funding, a shortage of skilled professionals, limited data availability and quality, regulatory and legal constraints, as well as cultural and societal resistance. Despite these challenges, AI and ML offer significant opportunities to enhance library services through improved information retrieval, automation of routine tasks, efficient resource management, increased accessibility, and the advancement of research and innovation. Drawing on successful case studies, the paper provides strategic recommendations aimed at guiding the effective implementation of AI and ML technologies in Nigerian libraries, ensuring they remain relevant and capable of meeting the evolving needs of users in the digital age.

Keywords: Machine learning, artificial intelligence, Nigerian libraries, challenges, opportunities

Introduction

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, particularly computer systems. Sheikh, Prin and Schrijvers (2023) stated that AI include learning (acquiring data and rules for using the data), reasoning (using rules to reach conclusions), and self-correction. In the same vain Aminu (2023); Emiri (2023) and Afolayan (2025) added that AI aims to create systems that can perform tasks that would normally require human intelligence, such as understanding natural language, recognizing patterns, problem-solving, and decision-making.

Machine Learning (ML) is a subset of AI that focuses on the development of algorithms and statistical models that enable computers to learn from and make predictions or decisions based on data, without being explicitly programmed for every task Kersting (2018). In other words, Soori, Arezoo and Dastres (2022) stated that machine learning allows systems to automatically improve their performance with experience over time. ML techniques are widely used in applications such as recommendation systems, speech recognition, image classification, and data analytics.

Artificial intelligence (AI) and Machine learning (ML) are the most essential technologies, and widely acceptable for use in healthcare, education, and library institutions. The integration of AI and ML in Nigerian libraries offers an important avenue for investigating both the challenges and opportunities it faces. A definition of the extent of AI and ML technologies is necessary before one can appreciate the need for adopting these technologies in Nigerian libraries. AI encompasses

computer systems that can perform tasks such as pattern recognition, natural language understanding, and problem-solving, which typically require human intelligence (Katiyar et al., 2024). Conversely, ML refers to algorithms that allow computers to learn from data and increase their performance without the need for explicit programming. Knowing these definitions prepares one to investigate how these technologies could completely transform Nigerian library services.

Nigeria, a nation rich in cultural heritage but increasingly in need of technological development, has libraries that serve as essential information and knowledge stores for its people. These libraries' inability to stay current with technological advances, however, frequently makes it more challenging for them to offer patrons effective and current services (Enakrire, 2023). By modernising with AI and ML, Nigerian libraries could overcome these challenges and improve their services to meet the changing demands of their users.

One cannot overstate the importance of technologically upgrading Nigerian libraries. Libraries must change to be effective in serving their communities in a time when knowledge is becoming more and more digitalized and easily available. AI and ML can help Nigerian libraries optimise resource management, simplify operations, and enhance user experiences (Tolulope, 2024). This modernization is not only a luxury but also a necessity to guarantee that libraries remain important hubs of knowledge sharing and learning in the digital age. As a result, this paper aims to investigate the complexities of implementing AI and ML in Nigerian libraries, as well as to clarify the possible advantages and challenges associated with this technical development.

Challenges of Implementing AI and ML in Nigerian Libraries

The effective integration and application of ML and AI in Nigerian libraries necessitates addressing several challenges. These challenges can be grouped into the following subsections.

Technological Infrastructure: Limited access to sophisticated computing resources is one of the main challenges Nigerian libraries face in using AI and ML technology. Without sufficient infrastructure in place, such as high-performance computer systems, libraries could find it difficult to use and apply AI and ML tools (Enakrire, 2023). An inadequate internet connection exacerbates this issue, as the successful implementation of AI and ML applications in libraries relies on seamless data processing and online resource access (Mahmud, 2024).

Financial Constraints: Funding is a major obstacle to the use of AI and ML in Nigerian libraries. Many libraries, particularly those with tight budgets, may find the high expenses of obtaining and sustaining AI and ML technology to be unaffordable (Tolulope, 2024). The general low funding available for libraries in Nigeria makes it more difficult for institutions to invest in the resources required to assist AI and ML projects (Blow, 2024).

Skilled Personnel: The dearth of qualified AI and ML experts in the Nigerian library sector is another major issue. A shortage of qualified staff members hinders the effective application and use of AI and ML technologies in library settings (Amzat, 2023). Therefore, continuing education and professional development programmes are necessary to bridge this gap, equipping library

employees with the necessary knowledge and skills to utilise AI and ML effectively (Barsha & Munshi, 2023).

Data Quality and Availability: Data quality and availability are major obstacles impeding the use of AI and ML in Nigerian libraries (Chika, 2024). Notably, because so many library items are still in old formats, inadequate digitalization of library resources makes it challenging to use AI and ML technologies to their full potential (Ailakhu, 2024). Also, because libraries lack defined procedures and infrastructure to manage massive amounts of data, maintaining and managing huge datasets can be challenging (Chika, 2024).

Policy and Regulatory Issues: Policy and regulatory concerns are also major obstacles to incorporating AI and ML into Nigerian libraries (Bali, 2024). The lack of encouraging government policies designed especially to direct the integration of these technologies impedes development in this field (Bi, et al, 2022). Furthermore, libraries face major obstacles because they must follow strict rules to protect user data and provide moral data handling procedures (Olujobi et al., 2021).

Cultural and Social Barriers: Further complicating the use of AI and ML in Nigerian libraries are cultural and societal obstacles (Baro & Nwabueze-Echedom, 2022). One typical problem is that people are reluctant to adopt new technology or procedures that go against established library procedures, both for staff members and customers (Iltis, 2023). Applications based on AI and ML raise ethical questions, particularly with regard to maintaining moral principles and protecting user privacy (Oladeinde, 2024).

Opportunities for Implementing AI and ML in Nigerian Libraries

Artificial intelligence (AI) and machine learning (ML) offer Nigerian libraries significant opportunities to enhance user experiences and modernise traditional services. AI-driven tools improve information retrieval in databases, archives, and catalogues (Enakrire, 2023), while ML algorithms personalise search results and suggestions based on user preferences (Tolulope, 2024), thereby boosting satisfaction and engagement. AI and ML can also automate repetitive tasks such as cataloguing and classification, improving efficiency and reducing manual workload (Mahmud, 2024). Chatbots and automated reference systems further streamline service delivery and allow staff to focus on complex tasks (Enakrire, 2023).

In resource management, predictive analytics help libraries anticipate user needs and make informed decisions about acquisitions. AI supports efficient digital resource management and ensures better access to electronic materials (Enakrire, 2023). AI technologies also enhance inclusivity and accessibility by offering features like text-to-speech and adaptive interfaces for users with disabilities, and by reaching underserved communities (Tolulope, 2024). Furthermore, AI and ML facilitate advanced research and innovation. Data analytics help scholars handle large datasets, enabling better knowledge discovery and fostering interdisciplinary collaboration.

Artificial Intelligence tools enhance community engagement by supporting personalised learning and lifelong education initiatives, expanding the impact of outreach programmes (Tolulope, 2024). Integrating AI and ML into Nigerian libraries presents numerous opportunities

across various aspects of library operations. The possibilities for AI technologies to revolutionise Nigerian libraries range from automating regular chores and boosting information retrieval to encouraging accessibility and resource management. By seizing these opportunities, Nigerian libraries can improve their services, better serve their communities, and maintain their leadership in digital age innovation.

Case Studies and Examples

Investigating the use of AI and ML in Nigerian libraries requires taking into account both pilot initiatives conducted in Nigeria and successful cases from other nations. Insightful information and best practices from successful implementations around the world can be applied to the Nigerian setting. As Yang et al. (2022) described, one noteworthy success story is the combination of AI and Google Earth Engine (GEE). In a number of applications, especially remote sensing and geographic analysis, this combination has demonstrated. Libraries using AI technology like GEE may improve data analysis, visualization, and decision-making processes, resulting in better services for patrons.

Furthermore, as Bichu et al. (2021) point out, the use of AI and ML in orthodontics shows how these technologies may completely transform conventional procedures. Artificial Neural Networks (ANNs) and Convolutional Neural Networks (CNNs) have greatly advanced orthodontic diagnosis accuracy and treatment planning. These developments have parallels that Nigerian libraries can employ to enhance resource management through AI-driven algorithms, tailor user experiences, and streamline information retrieval operations.

Turning now to the local environment and looking at current AI and ML projects in Nigerian libraries will help to clarify the viability and effects of these technologies. Though there may not be many specific AI implementation studies in Nigerian libraries, viewpoints from similar sectors within the country can be quite insightful. One study, for example, on cybersecurity dynamics in Nigerian banking emphasises the need for ongoing technological advancement and investment to counter cyber threats. Libraries can utilise AI and ML to enhance cybersecurity protocols, safeguard confidential data, and ensure the dependability of digital resources.

Moreover, as Bali (2024) notes, an examination of new developments in AI in Nigerian education shows a rising dependence on AI technology to improve learning results. Libraries can help academics and students with research, skill development, and knowledge sharing by integrating AI-driven instructional technologies. In addition, Mwangi's (2024) research on AI applications for supply chain process optimisation in Kenya might educate Nigerian libraries on how to leverage AI and ML integration to enhance inventory control, resource allocation, and operational effectiveness.

The survey by Bi *et al*. (2022) on AI-aided Internet-of-Things (IoT) technology emphasises the revolutionary potential of AI in changing library services in the context of smart libraries. By adopting smart technology driven by AI, Nigerian libraries can automate repetitive operations, enhance resource use, and provide patrons with engaging and customised experiences.

Furthermore, Cortial's (2024) study on AI in pharmaceutical repurposing emphasises the importance of AI in healthcare innovation. Nigerian libraries might consider collaborating with medical facilities to improve health literacy, provide access to medical information, and use AI-driven platforms to support research projects.

Ultimately, Nigerian libraries may strategically design and execute AI and ML projects by looking at successful AI implementations worldwide, learning from relevant domains in Nigeria, and investigating the revolutionary potential of AI in many industries. In the digital age, these technologies present chances to improve service delivery, optimize resource management, and encourage creativity within the library ecosystem, thereby promoting knowledge diffusion and empowering users.

Recommendations for Successful Implementation

When introducing AI and ML into Nigerian libraries, it is critical to take into account a number of suggestions for a successful rollout. Making these suggestions will help to guarantee that the integration of these technologies is efficient, long-lasting, and advantageous to the library environment. It is clear from a variety of academic works that important foundations for successful implementation are strategic planning and investment, capacity building and training, policy and advocacy, and community involvement (Huang, 2022; Harisanty et al., 2022; Subaveerapandiyan, 2023; Hussain, 2023; Mahmud, 2024).

Successful application of AI and ML in libraries is mostly dependent on strategic planning and funding. A thorough implementation strategy must outline the goals, objectives, and road map for integrating these technologies into library services (Hussain, 2023). Libraries could find it difficult to fully use AI without a defined plan. Finding enough money and resources is also critical (Hussain, 2023; Subaveerapandiyan, 2023). Libraries need to make the investments in the equipment, technology, and infrastructure required to efficiently support AI applications. Insufficient infrastructure can make AI in library services more difficult to use successfully (Hussain, 2023).

Training and capacity development turn out to be essential elements of successful AI and ML integration in libraries. Building training programmes for library employees is crucial to giving them the abilities and information they need to use AI technologies (Harisanty et al., 2022; Mahmud, 2024). Collaborations with academic institutions can help improve capacity-building initiatives by providing access to specialised training materials and knowledge. Libraries may guarantee that their employees are skilled at using AI tools to improve library services by making investments in ongoing education and skill development.

An enabling environment for the use of AI in libraries depends critically on policy and lobbying. It is crucial to advocate for favourable government policies to secure legislative and political support for AI projects in libraries (Huang, 2022). Creating rules for the use of ethical AI is just as crucial to guaranteeing that AI applications in libraries follow data privacy laws and ethical principles (Huang, 2022). Libraries can negotiate the possible legal and ethical obstacles to AI implementation by promoting supportive laws and creating ethical standards.

Community involvement is another important suggestion for the effective use of AI and ML in libraries. Participating in the implementation process with library users promotes inclusivity and ownership (Subaveerapandiyan, 2023; Jha, 2023). Libraries can tailor AI solutions to the specific needs and tastes of their communities by including users in decision-making processes and asking for their input. Additionally, increasing knowledge of the benefits of ML and AI is critical (Subaveerapandiyan, 2023; Mahmud, 2024). Understanding the potential benefits of AI technology among library users can help build acceptance and trust for these developments.

In the end, a calculated approach including strategic planning, capacity building, policy advocacy, and community involvement is required for the effective application of AI and ML in Nigerian libraries. By implementing these suggestions, libraries can leverage the transforming potential of AI to improve user experiences and services while keeping up with digital-age technology developments.

Conclusion

The application of AI and ML in Nigerian libraries presents a complex landscape with numerous opportunities and significant challenges. The major obstacles include insufficient financial resources, a shortage of qualified workers, issues with data availability and quality, challenges related to legislation and regulation, and cultural and societal barriers. These challenges emphasize the need for all-encompassing plans to overcome constraints and create an environment that promotes technical progress.

On the other hand, the prospects are significant and include better resource management, automated routine activities, better information retrieval, more accessibility and inclusivity, encouragement of research and innovation, and more community involvement. These advantages show how AI and ML may completely change library services and improve user experiences.

AI and ML provide Nigerian libraries with enormous and revolutionary potential advantages. Libraries can use these technologies to improve resource management, offer customised and inclusive services to their customers, and greatly increase their operational efficiency. Because AI and ML can automate repetitive operations, improve information retrieval, and support cutting-edge research projects, they are essential tools for updating library services and guaranteeing their continued relevance in the digital era. Stakeholders, including government agencies, educational institutions, and librarians, must aggressively support the implementation process in order to reap these rewards. This assistance ought to cover capacity building, infrastructure investment, strategic planning, and the creation of ethical standards and supporting laws. Therefore, conquering the challenges and realising the full potential of AI and ML in Nigerian libraries will require a coordinated effort from all stakeholders.

References

Afolayan, Oluyinka Titilope, "Drivers and Impediments in the Adoption of Artificial Intelligence by

Academic Libraries in Nigeria" (2025). Library Philosophy and Practice (e-journal). 8263. https://digitalcommons.unl.edu/libphilprac/8263

Ailakhu, U. (2024). Open Educational Resources (OER) management: implications for policymakers on the best practices in an open education university library in Nigeria. *Library Management, 45*(5), 273-286. https://doi.org/10.1108/lm-01-2024-0013

Aminu, M. B. (2024). Adoption of Artificial Intelligence for Library Operations in Federal University
Libraries in North West States of Nigeria. *BW Academic Journal*, *1*(3), 88–93. Retrieved from https://www.bwjournal.org/index.php/bsjournal/article/view/2135

Amzat, O. (2023). Metaverse-infused academic libraries: a glimpse into the future. *Library Hi Tech News, 40*(10), 17-19. https://doi.org/10.1108/lhtn-10-2023-0187

Bali, B. (2024). Analysis of emerging trends in artificial intelligence in education in Nigeria. https://doi.org/10.21203/rs.3.rs-3819828/v1

Baro, E. and Nwabueze-Echedom, A. (2022). An evaluation of institutional repository development in African universities. *IFLA Journal, 49*(1), 18-38. https://doi.org/10.1177/03400352221089672

Barsha, S. and Munshi, S. (2023). Implementing artificial intelligence in library services: a review of current prospects and challenges of developing countries. *Library Hi Tech News, 41*(1), 7-10. https://doi.org/10.1108/lhtn-07-2023-0126

Bi, S., Zhang, J., Huang, W., Wu, B., Gong, Y., & Ni, W. (2022). A survey on artificial intelligence aided internet-of-things technologies in emerging smart libraries. *Sensors, 22*(8), 2991. https://doi.org/10.3390/s22082991

Bichu, Y., Hansa, I., Bichu, A., Premjani, P., Flores- Mir, C., & Vaid, N. (2021). Applications of artificial intelligence and machine learning in orthodontics: a scoping review. *Progress in Orthodontics, 22*(1). https://doi.org/10.1186/s40510-021-00361-9

Blow, C. (2024). Comprehensive validation on reweighting samples for bias mitigation via aif360. *Applied Sciences, 14*(9), 3826. https://doi.org/10.3390/app14093826

Chika, E. (2024). Digital healthcare tools in Nigeria: strengthening public health and pandemic preparedness - insights from the covid-19 crisis. *Telehealth and Medicine Today, 9*(1). https://doi.org/10.30953/thmt.v9.445

Cortial, L. (2024). Artificial intelligence in drug repurposing for rare diseases: a mini-review. *Frontiers in Medicine, 11*. https://doi.org/10.3389/fmed.2024.1404338

Emiri, O. T. (2023). Adoption and Utilisation of Artificial Intelligence by Librarians in University

Libraries in Southern Nigeria. *Library Philosophy and Practice (e-journal).* 7570. https://digitalcommons.unl.edu/libphilprac/7570

Enakrire, R. (2023). Artificial intelligence as enabler of future library services: how prepared are librarians in African university libraries. *Library Hi Tech News, 41*(3), 1-5. https://doi.org/10.1108/lhtn-09-2023-0173

Harisanty, D., Anna, N., Putri, T., Firdaus, A., & Azizi, N. (2022). Leaders, practitioners and scientists' awareness of artificial intelligence in libraries: a pilot study. *Library Hi Tech, 42*(3), 809-825. https://doi.org/10.1108/lht-10-2021-0356

Huang, Y. (2022). Exploring the implementation of artificial intelligence applications among academic libraries in Taiwan. *Library Hi Tech, 42*(3), 885-905. https://doi.org/10.1108/lht-03-2022-0159

Hussain, A. (2023). Use of artificial intelligence in the library services: prospects and challenges. *Library Hi Tech News, 40*(2), 15-17. https://doi.org/10.1108/lhtn-11-2022-0125

Iltis, A. (2023). Ethical, legal, regulatory, and policy issues concerning embryoids: a systematic review of the literature. *Stem Cell Research & Therapy, 14*(1). https://doi.org/10.1186/s13287-023-03448-8

Jha, S. (2023). Application of artificial intelligence in libraries and information centers services: prospects and challenges. *Library Hi Tech News, 40*(7), 1-5. https://doi.org/10.1108/lhtn-06-2023-0102

Katiyar, N., Awasthi, M. V. K., Pratap, R., Mishra, M. K., Shukla, M. N., & Tiwari, M. (2024). Ai-Driven Personalized Learning Systems: Enhancing Educational Effectiveness. *Educational Administration: Theory and Practice, 30*(5), 11514-11524. https://doi.org/10.53555/kuey.v30i5.4961

Kersting K.(2018) Machine Learning and Artificial Intelligence: Two Fellow Travelers on the Quest for Intelligent Behavior in Machines. Front Big Data. 2018 Nov 19;1:6 doi: 10.3389/fdata.2018.00006. PMID: 33693322; PMCID: PMC7931929.

Mahmud, M. (2024). Ai in Bangladeshi libraries: opportunities and challenges. *Library Hi Tech News*. https://doi.org/10.1108/lhtn-04-2024-0053

Mwangi, J. (2024). Analyzing the role of artificial intelligence and machine learning in optimizing supply chain processes in Kenya. *International Journal of Supply Chain Management, 9*(1), 39-50. https://doi.org/10.47604/ijscm.2322

Oladeinde, M. (2024). Review of IT innovations, data analytics, and governance in Nigerian enterprises. *Computer Science & It Research Journal, 4*(3), 300-326. https://doi.org/10.51594/csitrj.v4i3.685

Olujobi, O., Ufua, D., Olokundun, M., & Olujobi, O. (2021). Conversion of organic wastes to electricity in Nigeria: legal perspective on the challenges and prospects. *International Journal of Environmental Science and Technology, 19*(2), 939-950. https://doi.org/10.1007/s13762-020-03059-3

Sheikh, H., Prins, C., Schrijvers, E. (2023). Artificial Intelligence: Definition and Background. In: Mission AI. Research for Policy. Springer, Cham. https://doi.org/10.1007/978-3-031-21448-6_2

Soori, M., Arezoo, B., & Dastres, R. (2022). Artificial intelligence, machine learning and deep learning in advanced robotics, a review. *Cognitive Robotics, 3,* 54-70. https://doi.org/10.1016/j.cogr.2023.04.00

Subaveerapandiyan, A. (2023). A study on the knowledge and perception of artificial intelligence. *IFLA Journal, 49*(3), 503-513. https://doi.org/10.1177/03400352231180230

Tolulope, A. (2024). Artificial intelligence research in Nigeria: topic modelling and scientometric analysis. *IAES International Journal of Artificial Intelligence (Ij-Ai), 13*(1), 597. https://doi.org/10.11591/ijai.v13.i1.pp597-609

Yang, L., Driscol, J., Sarigai, S., Wu, Q., Chen, H., & Lippitt, C. (2022). Google earth engine and artificial intelligence (ai): a comprehensive review. *Remote Sensing, 14*(14), 3253. https://doi.org/10.3390/rs14143253

Assessment of information Access and Dissemination Channels by the Ramat Library in University of Maiduguri, Nigeria

Augustine Uzoma Madu
Dept. Library and Information Science, University of Maiduguri

Ibrahim Vandi
Ramat Library, University of Maiduguri

Patience Odenigbo
Akanu Ibiam Federal Polytechnic Unwana, Afikpo, Ebonyi State

Abstract

This study examined the extent of information access by users in Ramat library of University Maiduguri, and the influence of various strategies such as the social media platform, current awareness service (CAS), websites and digital portals, Email newsletters alerts, library blogs and RSS feeds and Online Public Access Catalogs (OPACs) on information resources access. The sample comprised of 141 librarians and 131 library users who were selected through a convenience technique. Two sets of questionnaires, one for the library staff and the other for the library users were used for data collection. Descriptive statistics of frequency counts and percentage scores was used to analyze librarians' demographic information and extent of access to information by the library users. Research hypotheses were tested through an inferential statistic with Smanrtpls4 at o.05 level of significance. The result indicates that social media platforms significantly influenced current awareness services (CAS) ($T = 7.701$, $p < 0.001$), email newsletter alerts (ENA) ($T = 10.590$, $p < 0.001$), websites and digital portals (WDP) ($T = 5.475$, $p < 0.001$), and directly contributed to improved accessibility ($T = 3.183$, $p = 0.001$). Additionally, websites and digital portals were shown to have a strong and significant positive influence on accessibility ($T = 3.949$, $p < 0.001$), online public access catalogues (OPACs) exhibited a statistically significant negative influence on accessibility ($T = 2.387$, $p = 0.017$), however, current awareness services (CAS), email newsletter alerts (ENA), and library blogs and RSS feeds (LBR) had no significant influence on accessibility. Similarly, SMP did not significantly influence LBR. Recommendations were made based on the findings.

Key: ***Information Access, Dissemination, Channels, Strategies***

1. Introduction

Information is a very important instrument in the maintenance of a healthy society and sustenance of steady development in all facets of life. A well-organized information remains irrelevant until it is disseminated to the end user, to meet their various information needs. Information

dissemination is a core function of librarianship, playing a critical role in how libraries communicate knowledge, services, and resources to their users (Uchendu, 2024; Joel & Camble, 2021). Traditionally, libraries relied on face-to-face interactions, noticeboards, printed newsletters, and community outreach to relay information. These methods, while effective in earlier periods, were limited by time, geography, and the physical presence of users (Onobrakpor, 2020; Козарева, 2023). However, with the evolution of Information and Communication Technologies (ICT), librarianship has undergone a transformation, embracing digital tools to reach wider audiences with greater efficiency (Bawden and Robinson, 2022).

The integration of ICT into library operations has re-shaped the library operations such as the information dissemination through several strategies that inform efficiency. Mobile technologies have become key elements in modern library services. Omeluzor and Oyovwe-Tinuoye (2017) noted that mobile applications and SMS alerts enable librarians to deliver timely, personalized notifications about services, new materials, and events. This approach enhances direct communication with users. During the COVID-19 pandemic, Nigerian libraries adopted these tools to maintain user engagement despite physical limitations.

Librarians use various information dissemination strategies to address users' diverse needs. Information dissemination involves delivering relevant content tailored to users' specific requirements within the library context (Chapman et al., 2020). A core library function includes identifying, acquiring, organising, and efficiently sharing information. Selective Dissemination of Information (SDI) is a key method, particularly in academic libraries, where user profiles are created based on teaching and research interests to deliver targeted information (Ebaye & Osim, 2022; Rafiq, 2025). This personalised approach is enhanced by conducting surveys on users' perceived needs, enabling librarians to provide more relevant and necessary information (Rafiq, 2025).

Other strategies employed by the librarians in information dissemination includes Current Awareness Service (CAS), which keeps users informed about recent developments, new acquisitions, and research trends in their fields (Uzohue & Yaya, 2016). Librarians also utilize websites and digital portals as central hubs for accessing services, digital collections, and institutional announcements (Nair, 2021). The integration of social media platforms such as Facebook, Twitter, and Instagram WhatsApp, Imo and other web applications such as Google SMS, twitter and Pinterest can also be used in the library as strategies to disseminate information (Mensah & Bosire Onyancha, 2021). Email newsletters and alerts are regularly distributed to inform users of new resources, upcoming events, and important notices.

Extent of access to physical and digital collections is improved through Online Public Access Catalogs (OPACs), enabling users to search, reserve, and request materials remotely (Nwobu & George, 2024; Anurag & Mishra, 2023). Librarians also enhance users' information-seeking skills through information literacy sessions, workshops, and orientation programs for new users (Oladokun, Ibitoye, & Afolabi, 2024). Personalized research and reference support services offer expert assistance for complex information needs. In response to growing mobile technology use, libraries provide mobile services and apps for easier access to resources and updates. Additionally,

outreach and community engagement strategies extend library services to underserved populations and broader audiences in real time.

At Ramat Library, University of Maiduguri, extent of access is dependent on digital platforms, user awareness, infrastructure, and ICT integration. While services like OPACs, email alerts, and current awareness systems exist, their effectiveness is inconsistent. Challenges such as limited user training, unstable electricity, and poor internet connectivity hinder full access. However, using diverse dissemination tools like social media, blogs, and web portals can significantly improve the reach and usability of resources. There is dearth of studies in these areas, however, previous study indicated that the extent of accessibility to electronic information resources in Ramat Library is considerable, with 131 (77.1%) of respondents reporting that these resources are available (Ahmed & Anjili, 2015). This observation corresponds with Aguolu and Aguolu (2002), who indicated that, although resources may be bibliographically accessible, users frequently have difficulties accessing them. The study indicates that enhanced accessibility is associated with greater utilisation, as consumers favour services that require less effort to obtain.

Problem Statement

In the 21st century, the roles and responsibilities of librarians have shifted significantly due to the rapid development of information and communication technologies. University libraries are now expected to meet information needs of users who increasingly depend on digital platforms for research and academic engagement. Despite technological advancements, there remains a lack of clarity regarding on how librarians Ramat Library, University of Maiduguri, are adapting to these changes. The library operates in a challenging environment where outdated information dissemination methods, limited digital infrastructure, and insufficient integration of innovative tools hinder effective service delivery. Observations reveal that many librarians in Ramat library lack the necessary skills in digital literacy, media navigation, and user-centered communication required to meet the expectations of 21st-century users. As a result, there is an urgent need to assess and enhance the library's strategies for information dissemination and access in order to improve user satisfaction and sustain the library's relevance in the digital age. Based on the above challenges, this study examined the extent of information resources access and the influence of some key information dissemination channels, such as current awareness service (CAS), websites and digital portals, social media platforms, email newsletters alerts, library blogs and RSS feeds, and Online Public Access Catalogues (OPACs), on information resources access in Ramat Library, University of Maiduguri.

Research Hypotheses

The study is guided by the following hypotheses:

1. **H1:** Current Awareness Service (CAS) as information dissemination strategy has a significant influence on Information Access at Ramat library, University of Maiduguri.
2. **H2**: Websites and Digital Portals as information dissemination strategy has a significant influence on Information Access at Ramat library, University of Maiduguri

3. **H3:** Social Media Platforms has a significant influence on Information Access at Ramat library, University of Maiduguri
4. **H4**: Email newsletters alert as information dissemination strategy significantly influenced Information Access at Ramat library, University of Maiduguri
5. H5: Library blogs and RSS feeds as information dissemination strategy have significant influence on Information Access at Ramat library, University of Maiduguri
6. **H6:** Online Public Access Catalogs (OPACs) has a significant influence on Information Access at Ramat library, University of Maiduguri.
7. **H7**: social media portal has a significant influence on Current Awareness services (CAS), Email newsletters alerts, library blogs and RSS and web digital portal (WDP) on Information Access at Ramat library, University of Maiduguri.

Theoretical Review

This study is backed-up with several theories in information dissemination which include theory of the Distribution of Access to Information by Freese (1971), which posits that true access to information goes beyond availability and is defined by socioeconomic, institutional, and organisational constraints. Freese stressed that, although information is widely available, disparities in education, poverty, and restrictive regulations prevent equal access. To ensure equitable access to knowledge, the theory emphasises the importance of deliberate, inclusive dissemination strategies. Everett Roger's Diffusion of Innovations Theory (1962) emphasises the importance of adopter categories and communication routes in explaining how new concepts and technologies proliferate within a social system. Librarians find Rogers' theory useful when implementing new technology or services. Kurt Lewin's 1947 Gatekeeping theory, which explains how authorities regulate the flow of information, is comparable to the librarian's job of selecting and vetting reliable, pertinent sources. According to Katz, Blumler, and Gurevitch's 1974 Uses and Gratifications Theory, people are constantly looking for information to satisfy their particular needs, which motivates librarians to implement user-centred dissemination strategies. Furthermore, users seek to maximise informational gain while minimizing effort, according to Pirolli and Card's (1995) Information Foraging Theory. Collectively, these theories help academic librarians create all-encompassing information dissemination strategies that include responsive website design, social media platforms, current awareness services (CAS), an online public access catalogue (OPAC), open-access repository maintenance, personalisation, etc. The significance of these theories in relation to this study proposes that library managers ought to consistently share pertinent information with users, as this practice will substantially encourage users' efforts to satisfy their information needs.

The Conceptual Framework and Hypothesis Development

Influence of Current Awareness Services (CAS) on Information Access in the Library

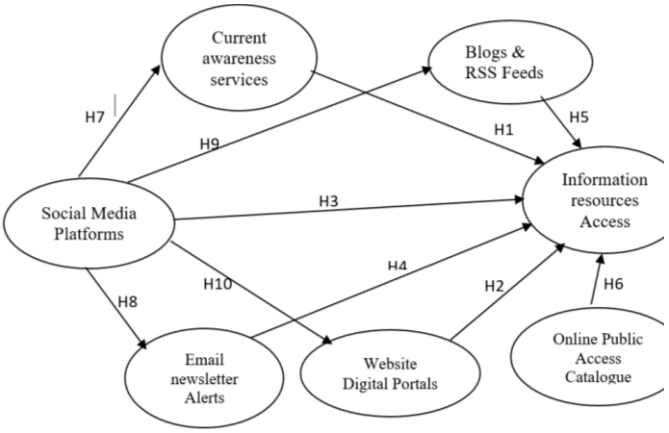


Figure 1: Conceptual Framework

Current Awareness Service (CAS) The Current Awareness Service (CAS) is a crucial library resource that offers users up-to-date information through awareness lists, SDI, and notifications about recent events and new releases. It has been identified as a veritable strategy the librarians employ to ensure that users have access to information resources, particularly the new arrivals, and other relevant information to the library community. Some studies have identified the fact CAS has played significant role in users' information services in the libraries. Cabonero, Tindaan, Attaban, and Manat (2019) employed quantitative and qualitative methods to evaluate the effectiveness of Current Awareness Services (CAS) at Saint Mary's University Learning Resource Centre (SMULRC). The study assessed user satisfaction and identified challenges faced by faculty and students. Findings showed that CAS effectively keeps users informed about new learning resources, supports research, and raises awareness. However, issues such as irregular updates, design flaws, and content quality concerns were noted. CAS also reflects librarians' role in academic knowledge dissemination and enhances library visibility. Positive outcomes from Rodgers Library (Gessesse, 1997) confirmed CAS's value in supporting research and faculty engagement.

Influence of Websites and Digital Portals (WDP) on Information Access in the Library

Websites and digital portals function as crucial access points for library resources and services to improve client satisfaction in information retrieval. An intuitive library website is essential for successful access to digital resources (Kumar, 2023), and serve as online platforms that enable users to access a diverse array of information from remote location (Onobrakpor, 2020). Research has proven that a poorly designed website or library portal inhibits the effective access to the library digital collection (Tenya, Maina & Awuor, 2024), while a well-designed library website enhances access to the library resources (Hombali, 2021). The undergraduate students found library websites highly useful for saving time, tracking materials, and engaging with library services (Khan, 2012; Harrath & Alobaidy, 2018). They were very satisfied with features like workshops and research support, though moderately satisfied with access to regulations, the institutional repository, and online book renewals.

Influence of Social Media Platforms (SMP) on Information Access in the Library

Social media has become an innovative tool for interaction, collaboration, and information dissemination in the digital age (Ulaş, 2021; Oyighan & Okwu, 2024). Its influence has permeated the academic libraries and thus increasingly influences user access to and interaction with information resources (Rajiv Kumar, Jatinder Kumar, 2025; Ihejirika, Goulding, & Calvert, 2020). Social media platforms, like Facebook, Twitter (now X), Instagram, YouTube, and LinkedIn, present dynamic channels for user engagement, service promotion, and rapid dissemination of updates regarding new collections, events, and policy (Wakahia & Owoche, 2024; Nguyen, 2023). Chan, Lam and Chiu (2020) investigated how effectively Facebook and Instagram are utilised by the University of Hong Kong Libraries (HKUL), using a mixed-method approach that includes content analysis of the libraries' posts on both platforms and user feedback gathered through on-campus interviews. Findings from the content analysis showed unexpectedly low user engagement on both social media platforms, with most posts focusing on library operations and event announcements. While interview participants expressed support for HKUL's presence on Facebook and Instagram, they also recommended a more engaging and creative use of these platforms to better capture users' interest.

Influence of Email newsletters alerts on Information Access in the Library

The utilisation of email newsletter notifications by librarians is crucial to improve information access in academic libraries. Librarians utilise email alerts to maintain direct and specific engagement with clients by sending selected content, including resource updates, research tools, service modifications, and event announcements (Rysavy, Michalak, & Daly, 2021). This information dissemination strategy enhances user knowledge of library services and collections and promotes the prompt use of available resources. Moreover, email newsletters function as an economical and unique communication instrument that connects the library with its varied user base, especially in distant and hybrid educational settings. Thus, the proficient use of email alerts by librarians substantially enhances equitable and informed access to information within academic environments (Rysavy, Michalak, & Daly, 2021). The librarians employ several strategies for information dissemination to ensure access.

Influence of library blogs and RSS feeds on Information Access in the Library

Library blogs and RSS (Really Simple Syndication) feeds have emerged as essential instruments for improving information accessibility and user interaction in academic libraries (Al-Qallaf & Ridha, 2018). Blogs enable librarians to disseminate timely updates, resource highlights, research strategies, and service notifications in a more colloquial and accessible manner (Kushniryk & Orlov, 2021). Likewise, RSS feeds allow users to obtain real-time updates from library websites, databases, and blogs simultaneously. These tools facilitate continuous and user-centric access to information; they promote a more knowledgeable and interconnected user community (Barman, 2020; Okocha & Eyiolorunshe, 2017). Furthermore, their asynchronous characteristics enable users to interact with content at their convenience, which is very advantageous in digital and remote learning contexts (Adewoye & Akinde, 2023; Reysa & Yelizaveta, 2018). The use of

library blogs and RSS feeds enhances the library's function as a proactive transmitter of knowledge and an enabler of effortless information access.

Influence of Online Public Access Catalogs (OPACs) on Information Access in the Library

OPACs have transformed into vital portals that provide efficient, organised access to library holdings and allow users to effortlessly search for books, journals, multimedia, and digital resources (Aju & Foti, 2020). As libraries evolve from traditional card catalogues to interactive digital systems, OPACs have become essential in facilitating equal and prompt access to information (Nwobu & George, 2024). Access to information mainly involves user behaviour, including searching, retrieving, and interacting with library resources; hence, OPAC is seen as a significant factor in improving access to information resources within libraries (Ternenge, Dorcas, & Terwase, 2020; Amadi, Shehu, & Mordi, 2023). Access to library resources is further influenced by OPAC, according to a study by Anurag Borpatra Gohain and Devanand Mishra (2023).

Influence of Social Media Platforms on Current Awareness services (CAS), Email newsletters alerts, library blogs and RSS and web digital portal.

The introduction of social media platforms into academic library services has fundamentally altered the context of information dissemination. Empirical evidence demonstrates that social media platforms have a positive effect on several online communication methods used by libraries, such as "Current Awareness Services" (CAS), email newsletter alerts, library blogs, RSS feeds, and web-based digital portals (Mogale & Bopape, 2023; Chore, 2023). Social media intensifies the scope, interactivity, and timeliness of CAS by enabling immediate updates, as well as customised information delivery, thus improving user engagement (Oyetola et al., 2023; Goswami & Pandya, 2021). Moreover, platforms like Facebook, Twitter, and Instagram are used to enhance the exposure of email notifications and blog content, promoting a more linked and reactive digital information landscape (Opiyo & Muthee, 2022; Oyetola et al., 2023). Social media facilitates the promotion and usability of online portals, acting as an intermediary that directs visitors to official library platforms and services (Abdul, 2013; Margam & Soni, 2024). This multifaceted impact highlights social media's function as an essential facilitator of library information dissemination and accessibility strategies in the 21st century.

Methodology

This research employed a descriptive survey through a quantitative method. and a standardised questionnaire for librarians and 141 users for data collection. The questionnaire was designed in accordance with the factors of the study. A pilot test of the questionnaire was conducted with 20 librarians from another public institution in the study area to establish its validity. The Cronbach's alpha reliability score for each factor varied from .780 to .910. Expert opinion on the questionnaire was accessed and views were integrated prior to the comprehensive data collection. Questionnaire on the influence of the information dissemination channels was administered to 141 librarians, while the questionnaire on extent of information resources accessibility was

administered to 131 library users. The respondents were selected through a convenience sampling method which is a non-parametric method of sampling. Convenience sampling method was used to elicit responses from the available librarians during the questionnaire administration, research data was collected during examination, student were not regular in the library while some were not ready to participate in the survey. This informed the use of available respondents based on convenience. Data collection was done through a face-to-face method. Descriptive analyses, including frequency counts, percentages, and mean scores, were done using SPSS version 27 to evaluate the extent of information resources access in the library and the demographic information of the librarians. We employed Smart PLS-SEM to test the study models and assess the hypotheses through a structural equation technique. Partial Least Squares Structural Equation Modelling (PLS-SEM) is advanced statistical software used to analyse complex and multivariate associations among variables (Hair & Alamer, 2022).

Data Analysis and Interpretation

The data analysis process begins with a descriptive evaluation of library staff' qualification and work division as well as access to information resources in the library, followed by the estimation of the measurement and structural model.

5.1. 1. Descriptive Analysis

Table 1: Demographic Information of Respondents

Demographic Information	Qualifications/Divisions	Frequency	Percent
Qualification of the Librarians	BLIS.BLS	121	85.8
	MLIS.NLS	18	12.8
	PHD LIS	2	1.4
Division of Service	Collection Dev.	14	9.9
	Cataloguing/Classification	15	10.6
	Circulation	24	17
	Research/Bibliographic	14	9.9
	Reference	13	9.2

Serial Div.	18	12.8
Information	13	9.2
E-library	11	7.8
American Corner	6	4.3
Others	13	9.2
Total	**141**	**100**

The demographic profile of the study participants provides details about their qualifications and areas of service. Among the 141 participating librarians, a substantial majority (85.8%) held a Bachelor's degree in Library and Information Science (BLIS/BLS), showing that most of the library personnel have received essential professional training. A small percentage (12.8%) possess a master's degree in library and information science (MLIS/MLS), while only 1.4% have obtained a PhD in library and information science, indicating a shortage of advanced academic qualifications. The Circulation unit had the biggest proportion of responders at 17%, followed by the Serials Division at 12.8% and Cataloguing/Classification at 10.6%. Collection, development, and research/bibliographic services constituted 9.9% of the respondents, while reference services, information services, and the category labelled "others" each included 9.2%. The e-library sector accounted for 7.8% representation, while the American Corner had the lowest at 4.3%. This distribution indicates a workforce predominantly engaged in fundamental library functions, including circulation, cataloguing, and serial administration, while a lesser number of people are employed in digital and specialised service sectors. The data indicates a primarily first-degree-qualified librarian workforce with a varied yet unequal distribution between service divisions, which affects the tactics used for information dissemination and access inside the library.

5.1.2. Extent of Information Resources Accessibility in Ramat Library

Table 2: Extent of Information Resources Accessibility in Ramat Library

	Items	VLE	LE	ME	HE	VHE
1	Social media platforms provide effective access to library information.	7 (5.3%)	10 (7.63%)	13 (10%)	64 (48.9%)	37 (28.24%)
2	Current awareness services help me discover new library materials	4 (3.1%)	9 (6.87%)	14 (10.69%)	59 (45%)	45 (34.4%)
3	Email newsletters from the library enhance my access to relevant resources.	5 (3.82%)	17 (12.98%)	14 (10.69%)	64 (48.9)	31 (23.66%)

4	The Online Public Access Catalogue is a useful tool for retrieving academic materials.	8 (6.1%)	11 (8.4%)	12 (9.2%)	59 (45%)	41 (31.3%)
5	Library blogs and RSS feeds are important for receiving library-related updates.	10 (7.6%)	16 (12.2%)	15 (11.5%)	55 (42%)	35 (26.7%)
6	The combination of all these tools has improved my overall access to information at the library.	9(6.9%)	10 (7.6%)	11 (8.4%)	61 (46.6%)	40 (30.5%)
	Summary	**7 (5.34%)**	**12 (9.2%)**	**13 (9.9%)**	**61 (46.56%)**	**38 (29%)**

On the extent of information accessibility according to the user's opinion in Table 2, a significant proportion of respondents acknowledged a high to very high level of access to information through various digital strategies. Social media platforms were rated highly, with 64 respondents (48.9%) reporting a high extent of access, while 37 respondents (28.24%) reported a very high extent. Current Awareness Services (CAS) were well-rated, with 59 users (45%) reporting a high extent and 45 (34.4%) a very high extent. Email Newsletter Alerts (ENA) also showed high access, with 31 (23.66%) reporting a very high extent. The Online Public Access Catalogue (OPAC) was also positively received, with 59 respondents (45%) indicating a high extent and 41 (31.3%) a very high extent. Library Blogs and RSS Feeds (LBR) received slightly higher low-level responses, with 10 (7.6%) indicating very low and 16 (12.2%) indicating low extent. The combined impact of all tools was highly rated by users, with 61 respondents (46.6%) indicating a high extent of improved access to information.

5.2. Measurement Model

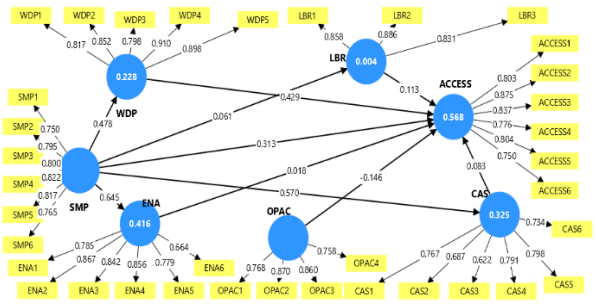


Figure 2: Measurement Model

This model translates theoretical concepts into measurable elements by establishing links between observed variables and their underlying constructs. It is vital for assessing the reliability and validity of constructs using metrics such as factor loadings, Cronbach's Alpha, composite reliability, and convergent and discriminant validity. The measurement model ensures the constructs are accurately and consistently measured before proceeding to analyze relationships within the structural model.

The measurement model (Figure 2) examines the influence of various digital and traditional dissemination strategies on the accessibility of library resources. The model consists of seven latent constructs which include Current Awareness Services (CAS), Websites and Digital Portals (WDP), Social Media Platforms (SMP), Email Newsletter Alerts (ENA), Library Blogs and RSS (LBR), Online Public Access Catalogues (OPACs), and information resources

accessibility (ACCESS). The data showed that Social Media Platforms (SMP) play a key role in how the different parts of the model relate to each other, having a strong positive effect on Email Newsletter Alerts (ENA) (β = 0.645), Online Public Access Catalogue (OPAC) (β = 0.570), and Websites and Digital Portals (WDP) (β = 0.478). These associations are notable because of their comparatively high path coefficients. SMP demonstrates a moderate direct effect on access to library resources (β = 0.313), but its impact on Current Awareness Services (CAS) (β = 0.083) is minimal. The model shows that ENA had a strong effect on OPAC (β = 0.664), highlighting the strong link between user engagement and using the catalogue, while ENA has a minimal direct effect on access to information resources (β = 0.018). Likewise, WDP demonstrates a moderate influence on ACCESS (β = 0.429), establishing it as the most potent individual predictor of ACCESS within the model. Nonetheless, its impact on Library Blogs and RSS feeds (LBR) is negligible (β = 0.061), and LBR subsequently exerts a feeble influence on ACCESS (β = 0.113). Significantly, OPAC adversely affects CAS (β = -0.146), indicating a potential bidirectional or suppressive link, but its direct impact on ACCESS is minimal (β = 0.113). CAS demonstrates a minimal impact on ACCESS (β = 0.083). Access to information resources is one of the most explained factors, with 56.8% of its changes explained by the model, followed by OPAC (R^2 = 0.570), ENA (R^2 = 0.416), CAS (R^2 = 0.325), WDP (R^2 = 0.228), and LBR (R^2 = 0.004). Over half (56.8%) of the variations in information access can be attributed to ENA, CAS, and OPACs, whereas 44.3% of ENA is affected by SMP and WDP. The exceedingly low R2 for LBR indicates that blogs and RSS feeds currently lack significance as information sources for Ramat library. The model illustrates that structured digital methods, such as email newsletter notifications and current awareness services, are crucial for enhancing information accessibility. Social media platforms and web portals perform facilitative roles, although traditional tools like blogs and OPACs require modifications to their effectiveness in improving resource accessibility at Ramat Library. The results indicate that whereas SMP and WDP are significant determinants of access to information resources, parameters such as library blogs and RSS feeds and CAS have negligible influence on predicting access to library information resources.

5.3: Construct Reliability and Validity

Table 3: Construct Reliability and Validity

Factors	Cornbrash's alpha	Composite reliability (rho_a)	Average variance extracted (AVE)	ACCESS	CAS	ENA	LBR	OPAC	SMP
ACCESS	0.894	0.906	0.654						
CAS	0.829	0.835	0.541	0.609					
ENA	0.888	0.905	0.643	0.382	0.215				
LBR	0.825	0.883	0.514	0.204	0.187	0.088			
OPAC	0.832	0.849	0.665	0.201	0.107	0.330	0.125		
SMP	0.867	0.867	0.653	0.659	0.659	0.739	0.091	0.073	
WDP	0.909	0.919	0.733	0.710	0.710	0.209	0.187	0.074	0.524

The analysis of construct reliability and validity in the study indicates that the measurement model exhibits adequate empirical qualities. The internal consistency reliability was checked using Cronbach's Alpha and Composite Reliability (CR), and all seven constructs—Current Awareness Services (CAS), Websites and Digital Portals (WDP), Social Media Platforms (SMP), Email Newsletter Alerts (ENA), Library Blogs and RSS (LBR), Online Public Access Catalogues (OPACs), and Accessibility (ACCESS) scored above the acceptable level of 0.70. Cronbach's Alpha values ranged from 0.825 (LBR) to 0.909 (WDP), while CR values ranged from 0.835 (CAS) to 0.919 (WDP), indicating a reliable and strong internal consistency (), and measurement accuracy across variables (Izah et al., 2024). Convergent validity, assessed via the Average Variance Extracted (AVE), was also adequate, with all constructs recording AVE values above the recommended minimum of 0.50 (). These results confirm that significant amounts of variance in each construct are explained by its corresponding indicators. Furthermore, discriminant validity, evaluated using the Fornell-Larcker criterion, generally holds since each construct's AVE square root exceeds its correlations with other constructs. However, we discovered significantly strong inter-construct correlations across SMP, ENA, and CAS (ranging from 0.659 to 0.739), suggesting potential conceptual overlaps. This suggests that further investigation is necessary, potentially using the Heterotrait-Monotrait (HTMT) ratio or cross-loading analysis to pinpoint the distinctive features of these constructs. Overall, the measurement model displays strong reliability and acceptable validity, supporting its application to evaluate strategies for information dissemination and access in the Ramat library environment.

5.4: Assessment of Structural Model

The hypotheses were tested through a structural model (Figure 3). The part coefficients were labelled with the t-values for various line of influence while the p-values are presented on table 4.

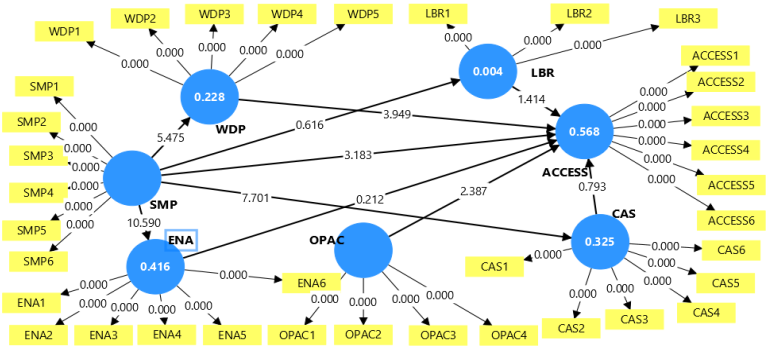


Figure 3: Structural Model

Table 4: Direct Influence

Variables	Original sample (O)	Sample mean (M)	STDEV	*T statistics*	*P values*	*Remarks*
CAS -> ACCESS	0.083	0.078	0.104	0.793	0.428	NS
ENA -> ACCESS	0.018	0.022	0.084	0.212	0.832	NS
LBR -> ACCESS	0.113	0.111	0.080	1.414	0.157	NS
OPAC -> ACCESS	-0.146	-0.149	0.061	2.387	0.017	S
SMP -> ACCESS	0.313	0.309	0.098	3.183	0.001	S
SMP -> CAS	0.570	0.577	0.074	7.701	0.000	S
SMP -> ENA	0.645	0.648	0.061	10.590	0.000	S
SMP -> LBR	0.061	0.069	0.099	0.616	0.538	NS
SMP -> WDP	0.478	0.482	0.087	5.475	0.000	S
WDP -> ACCESS	0.429	0.431	0.109	3.949	0.000	S

H1: Current Awareness Service (CAS) has a significant influence on Information Access at Ramat library, University of Maiduguri.

Current awareness services were considered a vital channel to information dissemination and access in the library. However, the influence of current awareness services on access to information in the library did not prove to be significant with (*t=0.793*, *p=0.428*) greater than 0.05 significant level. Therefore, the hypothesis which predicted a significant influence is hereby rejected.

H2: Websites and Digital Portals have a significant influence on Information Access at Ramat library, University of Maiduguri.

The importance of websites and digital portals in information access, this was justified with a influence on information access in Ramat library. Accordingly, the t-value of 3.949 greater than

1.96 threshold, and p- 0.000 less than 0.05 significant revealed a significant influence. Therefore, the hypothesis is supported at (*T=3.949, P=0.001*)

H3: Social Media Platforms has a significant influence on Information Access at Ramat library, University of Maiduguri.

The results indicates that social media platforms (SMP) play a pivotal and statistically significant influence to enhance information dissemination and accessibility with (*T = 3.183, p = 0.001*). the indices are with the accepted values; therefore, the hypothesis is retained.

H4: Email newsletters alert has a significant influenced Information Access at Ramat library, University of Maiduguri.

Contrary to expectation, Email newsletters alert did not provide a significant influence on information access in the library. According to the data in table 4 (*T=0.212, P=0.832*), a t-value of 0.212 is greater than the critical ratio of 1.96 while p value of 0.832 is greater than the 0.05 level of significant. The hypothesis is therefore rejected.

H5: Library blogs and RSS feeds has a significant influence on Information Access at Ramat library, University of Maiduguri.

The results in table 4 indicated that library blogs and RSS feeds did not prove to be a significant influencer of information access in the library with (*T=1.414, P=0.157*). The t-value and the significant level did not meet the required threshold to be adjudged significant. Therefore, the hypothesis is hereby rejected.

H6: Online Public Access Catalogs (OPACs) has a significant influence on Information Access at Ramat library, University of Maiduguri.

As one of the conventional information dissemination strategies in the libraries, OPAC proved to be vital to enhance access. According to information in table 4, OPAC had a significant influence on information access with (*T=2.387, P=0.017*). With all the indices meeting that accepted threshold, the hypothesis is therefore accepted.

H7: social media portal has a significant influence on Current Awareness services (CAS), Email newsletters alerts, library blogs and RSS and web digital portal (WDP) on Information Access at Ramat library, University of Maiduguri.

Social media platforms significantly influenced current awareness services (CAS) ($T = 7.701$, $p < 0.001$), email newsletter alerts (ENA) ($T = 10.590$, $p < 0.001$), and websites and digital portals (WDP) ($T = 5.475$, $p < 0.001$). the hypothesis which proposed a significant influence of social media platforms on CAS, ENA and WPD is accepted.

Discussion of the Findings

The extent of information resources access among users in Ramat library, indicated that 46.56% had a high extent of information access while 29% access information to a very high extent. On the other hand, 5.34% and 9.2% accessed information to a very low and low extent while 9.9% had a moderate extent of access. This indicates the premium the library users placed on information, according to Oladokun et al., (2024), librarians should prioritise information literacy training, orientation workshops to enhance users' information access.

These results indicate the importance of well-maintained digital infrastructure in modern library services, with emphasis on Ramat library, university of Maiduguri. However, online public access catalogues (OPACs) exhibited a statistically significant influence on accessibility. This finding is in line with Aju and Foti (20200 n which OPAC was said to enhance organised access and facilitate equal and prompt access to information (Nwobu & George, 2024). Further, Websites and Digital Portals has a significant influence on Information Access at Ramat library, University of Maiduguri, this finding is corroborated by previous studie which found the WDP enhance remote access (Onobrakpor, 2020). And a well-designed library website enhances access to the library resources (Hombali, 2021).

Social media platforms proved to be a significant influencer of information access in the library, this finding confirmed previous studies such as (Rajiv Kumar, Jatinder Kumar, 2025; Ihejirika, Goulding, & Calvert, 2020), in which social media improved resources awareness, service promotion, as well as and rapid dissemination of updates of resources (Nguyen, 2023).

social media portal has a significant influence on Current Awareness services (CAS), Email newsletters alerts, library blogs and RSS and web digital portal (WDP) towards information access with ($T = 2.387$, $p = 0.017$), ($T = 3.183$, $p = 0.001$) and ($T=3.949$, $P=0.001$) respectively. These findings are supported by previous studies such as interactivity, and timeliness of CAS through social media (Oyetola et al., 2023; Goswami & Pandya, 2021), improved email notifications and blog content, (Opiyo & Muthee, 2022), as well as promotion and usability of online portals, acting as an intermediary between visitors and library platforms and services (Abdul, 2013; Margam & Soni, 2024). Conversely, current awareness services (CAS), email newsletter alerts (ENA), and library blogs and RSS feeds (LBR) did not show significant influence on accessibility, with p-values of *0.428, 0.832, and 0.157*, respectively. Similarly, SMP did not significantly influence LBR (*$T = 0.616$, $p = 0.538$*), indicating a weak integration between these platforms. Overall, the results show that social media platforms and digital portals are the most effective strategies for enhancing information accessibility, while traditional tools like current awareness services, email newsletter alerts, library blogs and RSS, and online public access catalogues may require improvement to meet the needs of 21st-century library users.

Conclusion

Based on the findings of this study, it can be concluded that information accessibility among users of Ramat Library, University of Maiduguri, is generally high, with a significant proportion of users reporting extensive access to library resources. This reflects a growing recognition of the value of

timely and relevant information. The study revealed that digital tools such as Online Public Access Catalogues (OPACs), websites and digital portals, and social media platforms play a crucial role in enhancing users' access to information. Among these, social media and digital portals emerged as the most effective strategies, particularly due to their capacity to disseminate updates rapidly, promote services, and support remote access. Conversely, traditional tools such as Current Awareness Services, Email Newsletter Alerts, and Library Blogs and RSS feeds were found to have limited impact on accessibility, suggesting the need for their strategic redesign and better integration with more dynamic platforms. Overall, the study highlights the significance of robust digital information dissemination channels and access.

Recommendations

This study recommends that:

1. the management of Ramat Library should consolidate and invest more in social media platforms, websites, digital portals and an online public access catalogue by enhancing the tools, expanding their reach and providing continuous support and training.
2. The library management should investigate the underlying causes, redesign strategies, and strengthen the dissemination strategies that have no significant influence on information accessibility, such as current awareness services (CAS), email newsletter alerts (ENA), and library blogs and RSS feeds.
3. The library must balance the adoption of innovative digital strategies and refine the conventional services to ensure inclusive, equitable, and effective information dissemination and access in the 21st century.
4. the integration of the strategies serves as a guide for Ramat Library to reinforce the significant factors, while efforts should be made to modify the non-significant components of its information dissemination.

References

Abdul, A. T. (2013). The impact of web Portal in library and information services in the 21st century. Journal of Educational and Social Research. https://doi.org/10.5901/jesr.2013.v3n10p37

Ahmed, H. M., & Anjili, H. C. (2015). Utilization of electronic information resources in Ramat Library, University of Maiduguri, Nigeria. *Information Impact: Journal of Information and Knowledge Management*, 6(2), 195-206.

Amadi, E., Shehu, N., & Mordi, G. N. (2023). Utilization of Online Public Access Catalogue (Opac) As A Retrieval Tool for Information Resources In Some Selected University Libraries In South-South Nigeria. *Tin-City Journal of Library, Archival and Information Science*, *12*(2).

American Library Association (ALA). (2020). Libraries Build Strong Communities. *American Library Association*. Retrieved April 20, 2025, from https://www.ala.org/

Awang, M. M., & Careemdeen, J. D. (2021). The Relationship between Social Capital and Soft Skills among University Students. *Journal of Community Engagement and Higher Education*, 34(10), 40-46. DOI: 10.9734/JESBS/2021/v34i1030361

Barman, B. (2020). Changing the Ways the Libraries Reach to the User: RSS and its Applications in Libraries with Special Reference to Feedburner. *Library Philosophy and Practice (e-journal).* 3832. https://digitalcommons.unl.edu/libphilprac/3832

Bawden, C., and Robinson, L (2022) Communicating information: Changing contexts. (2022). Introduction to Information Science, 249-266. Cambridge University Press doi:10.29085/9781783304967.015

Cabonero, D. A., Tindaan, C. B., Attaban, B. H. O., & Manat, D. A. S. (2019). The effectiveness, reasons and problems in current awareness services in an academic library towards crafting an action plan.). *Library Philosophy and Practice (e-journal). 2493*. https://digitalcommons.unl.edu/libphilprac/2493.

Chen, T., & Ke, H. (2017). Public library as a place and breeding ground of social capital: A case of Singang library. *Malaysian Journal of Library & Information Science*, 22(1), 45-58. https://doi.org/10.22452/mjlis.vol22no1.4

Chen, Z., Oh, P., & Chen, A. (2021). The role of online media in mobilizing large-scale collective action. *Social Media + Society*, 7(3), 205630512110338. https://doi.org/10.1177/20563051211033808

Chore, N. (2023). Use of social media in academic library. *IP Indian Journal of Library Science and Information Technology*, 8(1), 37-46. https://doi.org/10.18231/j.ijlsit.2023.007

Emezie, N. A., &Nwaohiri, N. M. (2013). 21st Century librarians and effective information service delivery. *Journal of Information & Knowledge Management*, 4(1), 30-43

Freeze, B. O. (1971). Theory and values: Its relevance to education. Andrew Unity Press.

Goswami, V. S., & Pandya, V. C. (2021). The role of social media technology in the library: A study. Indian *Journal of Information Sources and Services*, 11(2), 16-20. https://doi.org/10.51983/ijiss-2021.11.2.2870

Harrath, Y., & Alobaidy, H. (2018). Impact of social networking sites on student academic performance: the case of university of Bahrain. In *Student engagement and participation: Concepts, methodologies, tools, and applications* (pp. 1238-1254). IGI Global.

Hombali, P. (2021). Designing User-Friendly Library Websites: Best Practices. *International Journal of Research and Analytical Reviews (IJRAR)*, *8*(2), 299-303.

Igbinovia, M. O. (2022). Public libraries as enablers of sustainable development. *Advances in Library and Information Science*, 341-351. https://doi.org/10.4018/978-1-7998-9094-2.ch022

International Federation of Library Associations and Institutions (IFLA. (2017, March 5). FLA Guidelines for Library Services to Multicultural Communities. IFLA. Retrieved April 20, 2025, from https://www.ifla.org

Izah, S. C., Sylva, L. L., & Hait3, M. M. (2024). Cronbach's Alpha: A Cornerstone in Ensuring Reliability and Validity in Environmental Health Assessment. *ES Energy & Environment*, 23(1057), 1-14. https://dx.doi.org/10.30919/esee1057

Khan, S. (2012). Impact of social networking websites on students. *Abasyn Journal of Social Sciences*, *5*(2), 56-77.

Kodikara, R. C., Seneviratne, T. M., & Punchihewa D, C. N. (2013). Beyond these walls: Building a library outreach program at Oakland University. *Outreach Services in Academic and Special Libraries*, 13-26. https://doi.org/10.4324/9780203725719-4

Kumar, T. (2023). The multifaceted impact of libraries on sustainable development in contemporary society. *International Journal of Science and Research* (IJSR), 12(7), 1991-1992. https://doi.org/10.21275/sr23725150506

Lee, K. S., & Chen W. (2017). A long shadow: Cultural capital, techno-capital and networking skills of college students. *Computers in Human Behavior*, 70, 67-73. http://dx.doi.org/10.1016/j.chb.2016.12.030

Margam, M., & Soni, S. (2024). A systematic review of application of social media in libraries. *DESIDOC Journal of Library & Information Technology*, 44(1), 45-49. https://doi.org/10.14429/djlit.44.1.18935

Mensah, M., & Onyancha, O. B. (2021). Ghanaian academic libraries' use of social media: A structural equation modelling approach. Information Development, 38(2), 323-342. https://doi.org/10.1177/0266666921999429

Mogale, M. G., & Bopape, S. (2023). Trends and issues relating to social media utilisation in academic libraries: Experiences from the University of Limpopo subject librarians. SA Journal of Information Management, 25(1). https://doi.org/10.4102/sajim.v25i1.1580

Mubofu, C., & Mambo, H. (2021). The role of libraries in community empowerment: A systematic review. Indonesian Journal of Librarianship, 1-16. https://doi.org/10.33701/ijolib.v2i1.1492

Nwankwo, E. P. (2020). Librarians 'emerging Skills for the 21st Century Information Service Delivery in Academic Libraries in Nigeria. *NAU Journal of Library and Information Science*, 5, 8-14.

Nwobu, B. K., & George, E. S. (2024). Access to Information Resources Using the Online Public Access Catalogue (OPAC) in the 21st Century. *The Catalyst Journal of Library and Information Literacy-CJLIL, 3*(1), 140-153.

Ogar, C. E. (2022). The role of libraries in promoting entrepreneurship education in Nigerian universities. *International Journal of Library and Information Science studies*, 8(1), 1-8. https://doi.org/10.37745/ijliss.15/vol9no1pp.1-8

Ogunmodede, T. A., Adio, G., Aboyade, M. A., Ebijuwa, A. S., & Oyetola,, S. O. (2023). The role of library and information services in achieving sustainable development: Issues and challenges. International *Journal of Library and Information Science studies*, 9(2), 30-40. https://doi.org/10.37745/ijliss.15/vol9n23040

Okocha, F., & Eyiolorunshe, T. A. (2017). User centered libraries in Africa: The role of library 2.0 tools. *Journal of Applied Information Science and Technology*, *10*(1), 85-90.

Okoroma, F. N. (2023). Library and information science initiatives and resources for sustainable development. *Advances in Image and Video Processing*, 11(3), 829 -837. https://doi.org/10.14738/aivp.114.15074

Oladokun, T., Ibitoye, A. R., & Afolabi, T. R. (2024). Information literacy, libraries, and the Nigerian public sphere. Advances in Library and Information Science, 142-155. https://doi.org/10.4018/979-8-3693-1143-1.ch008

Omeluzor, S. U., & Oyovwe-Tinuoye, G. O. (2017). Assessment of information and communication technology for selective dissemination of information and current awareness services: A case study of University libraries in the south-west zone of Nigeria. Evidence Based Library and Information Practice, 12(4), 233-249. https://doi.org/10.18438/b84x09

Opiyo, L. A., & Muthee, W. (2022). Influence usage of media platforms in improving uptake of academic library services in selected universities in Kenya. *International Journal of Current Aspects*, 6(3), 113-124. https://doi.org/10.35942/ijcab.v6i3.281

Oyetola, S. O., Aderibigbe, N. A., & Oladokun, B. D. (2023). Implications of social media technologies (SMTs) to library services. *Library Hi Tech News*. https://doi.org/10.1108/lhtn-03-2023-0037

Oyighan, D., & Okwu, E. (2024). Social media for information dissemination in the digital era. *RAY: International Journal of Multidisciplinary Studies*, *10*(1), 1-21.

Rafiq, R. A. M. (2025) Key library services for researchers: The role of hidden, selective dissemination of information (SDI) in fact-finding and implementation. *International Journal of Humanities and Social Science Research*, 11(1), 16-23

Reysa, A., & Yelizaveta, K. (2018). Synchronous and asynchronous engagement in virtual library services as learning support systems from the perspectives of post-graduate students: a case study-graduate students: a case study. *Journal of Information Science Theory and Practice*, *6*(1), 45-64.

Ryan, S. E., Evans, S. A., & Hawamdeh, S. (2023). Public libraries as key knowledge infrastructure needed to empower communities, promote economic development, and foster social justice. *Advances in Librarianship*, 203-218. https://doi.org/10.1108/s0065-283020230000053019

Seiter, A. (2022). *The Information and Knowledge Landscapes of Mutual Aid: How Librarians Can Use PAR to Support Social Movements in Community Development*. In Handbook on Participatory Action Research and Community Development, edited by Randy Stoecker and Adrienne Falcón. Handbook on Participatory Action Research and Community Development, 342–358. https://doi.org/10.4337/9781839100970.00028

Shapiro, S. (2010). Using google calendar as an email alert system for electronic resource renewals. *Journal of Library Innovation*, *1*(1), 52.-56

Tenya, A. N., Maina, J. C., & Awuor, F. M. (2024). Visual Design as the Impetus for Access and Utilization of Information in Digital Resource Platforms in University Libraries. *Open Access Library Journal*, *11*(3), e11308. doi.10.4236/oalib.1111308

Ternenge, T. S., Dorcas, T. N., & Terwase, A. C. (2020). Perceived impact of online public access catalogue (OPAC) on effective retrieval of information resources by postgraduate students in Benue state university, Makurdi. *Journal La Edusci*, *1*(6), 25-36.

Uzohue, C. E., & Yaya, J. A. (2016). Provision of current awareness services and selective dissemination of information by medical librarians in technological era. *American Journal of Information Science and Computer Engineering*, 2(2), 8-14.

Williams N., Huggins R., & Thompson P. (2018). Entrepreneurship and Social Capital: Examining the Association in Deprived Urban Neighbourhoods. *International Journal of Urban and Regional Research*, 44(2), 289-309. https://doi.org/10.1111/1468-2427.12589

Wood, E. (2020). Libraries full circle: The cross section of community, the public sphere, and third place. *Public Library Quarterly*, 40(2), 144-166. https://doi.org/10.1080/01616846.2020.1737491