

**UTILISATION OF DIGITAL LIBRARY SERVICES FOR RESEARCH ACTIVITIES BY
POSTGRADUATE STUDENTS IN KASHIM IBRAHIM LIBRARY, AHMADU
BELLO UNIVERSITY, ZARIA**

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AUGUST, 2024

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE
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IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF
MASTER DEGREE IN LIBRARY SCIENCE (MLS) DEPARTMANT OF LIBRARY
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AUGUST, 2024

DECLARATION

I declare that this Dissertation entitled Utilisation of Digital Library Services for Research Activities by Postgraduate Students in Kashim Ibrahim Library, Ahmadu Bello University Zaria was undertaken by me in the Department of Library and Information Science. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

Haruna ALHASSAN

.....

.....

P21EDLS8410

Signature

Date

CERTIFICATION

This Dissertation entitled **UTILISATION OF DIGITAL LIBRARY SERVICES FOR RESEARCH ACTIVITIES BY POSTGRADUATE STUDENTS IN KASHIM IBRAHIM LIBRARY, AHMADU BELLO UNIVERSITY, ZARIA** by Haruna ALHASSAN meets the regulations governing the award of degree of Master of Library Science (MLS) of Ahmadu Bello University Zaria and is approved for its' contribution to knowledge and literary presentation.

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LIST OF ABBREVIATIONS

AACR:	Anglo American Cataloguing Rules
ABU;	Ahmadu Bello University, Zaria
BBCS:	Bliss Bibliographic Classification Scheme
CLS :	Colon Classification Scheme
DBS:	Digital Books Service
DCCS:	Digital Cataloguing and Classification Service
DDCS:	Dewey Decimal Classification Scheme
DDDS:	Digital Document Delivery Service
DJS :	Digital Journal Service
DL:	Digital Library
DLS:	Digital Library Service
DRS:	Digital Reference Service
DSDIS:	Digital Selective Dissemination of Information Service
DTDS:	Digital Thesis and Dissertation Service
EMCS:	Elizabeth Moys Classification Scheme
ICTs :	Information and Communication Technologies
KIL:	Kashim Ibrahim Library
LCCS:	Library of Congress Classification Scheme
NBTE:	National Board for Technical Education
NCCE:	National Commission for Colleges of Education
NUC:	National University Commission
OPACS:	Online Public Access Catalogue Service
PG :	Postgraduate Students
WWW:	World Wide Web

ABSTRACT

This research is carried out with a view to investigate the utilisation of digital library services for research activities by postgraduate students in Kashim Ibrahim Library, Ahmadu Bello University Zaria. Four research questions were raised and some of them are; what types of digital library services do postgraduate students accessed for research activities in Kashim Ibrahim Library, Ahmadu Bello University, Zaria? For What research activities do postgraduate students utilize digital library services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria? Quantitative research methodology was adopted for the study by employing cross sectional research design. A total number of 2800 postgraduate students were used as population of the study, while sample size of 338 was drawn. The copies of questionnaire were used to collect data for the study. The data collected was presented and analyzed using frequency table, simple percentage, mean and standard deviation. The study revealed that the types of digital library services were Digital journals service, Digital theses and dissertations service and Online public access catalog service. The study also revealed that the procedure for accessing digital library services is through Digital Repositories, through Subscribed Databases, through Open Access Databases and through E-book Areas. The findings shows that these services are underutilised by postgraduate students. Furthermore, The findings revealed that digital library services include digital journals, digital theses and dissertations, and online public access catalogs. Identification of area of interest and consulting related literature is used in research activities performed by postgraduate students of Ahmadu Bello University Zaria. The postgraduate students of Ahmadu Bello University Zaria were highly satisfied with Digital Journals Service. The study recommended that there is need for the management of Kashim Ibrahim Library at Ahmadu Bello University to lay an emphasis on the least type of digital library services for postgraduate students, which include the digital inter library loan service, the digital document delivery service and the digital book service. There is need for the management of Kashim Ibrahim Library, Ahmadu Bello University, Zaria, to enhance the most digital library services for postgraduate students. The study suggests that the management of Kashim Ibrahim Library, Ahmadu Bello University, Zaria, should focus on improving digital library services for postgraduate students.. The library should also educate students on the use of digital services through orientation programs and seminars. There is a need for the management of Kashim Ibrahim Library, Ahmadu Bello University, and Zaria to improve their existing digital library services in order to ensure their effectiveness and efficiency. The

management of Kashim Ibrahim Library should enlighten more on the utilisation of digital library services through the orientation programs, seminars, and awareness programs organized by the staff members of Kashim Ibrahim Library, Ahmadu Bello University, Zaria.

Keywords: Digital Library Services, Kashim Ibrahim Library, Postgraduate Students, Research Activities, Utilisation

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In universities, research plays a vital role and is essential to postgraduate education. National development goals can only be realized on the foundation of research efforts. In general, a nation's ability to provide the necessary basis for its knowledge economy depends heavily on the quality of its educational system. Libraries are recognized as respectable members of the international intellectual community based on a number of criteria, including their research reputation and capacity. Postgraduate students' research is among these types of studies. Therefore, postgraduate research plays a crucial role in the library's operations and greatly enhances the institution's reputation for research. Research projects undertaken by postgraduate students are a type of apprenticeship done under instructors' supervision. Postgraduate students can methodically examine societal problems and suggest answers by conducting research. Postgraduate students can advance knowledge through research. The library acts as the society's repository for intellectual knowledge, keeping it organized so that postgraduate students can access it. Postgraduate students require access to a wide range of library materials in various formats and types, such as microforms, computers, videotapes/cassettes, journals, indexes, abstracts, newspapers, periodicals, reports, CD-ROM databases, and the internet. Additionally, there are electronic resources including phones, radio messages, computers that can be used, photocopiers, microforms, microform readers, fax machines, internet, local area network, and illumination. These materials available in the university libraries must be capable of supporting the research activity of postgraduate students. The library needs to provide postgraduate students with important library resources such as online journals, user friendly Online Public Access Catalogue (OPAC), well organised and easy to access. There is a need for libraries to understand

the resources that facilitate the research activities of postgraduate students, ongoing updates on new information resources, maintaining research repositories and provision of database training sessions. These resources are needed for varieties of purposes and their uses depend on their availability. For centuries, libraries have been the source of keeping and disseminating information through books, journals, maps and other resources that are used by students in the universities. It is clear that library resources i.e., human resources, physical resources, printed and e-resources are essentially important in preparing postgraduate students to conduct their researches. However, the use of library resources is a crucial recurring theme in the literature. The more accessible library resources are, the more likely they are to be utilised. Postgraduate students tend to use library resources that require the least effort to access. Understanding library use would aid the planning of future services but will also encourage patronage among postgraduate students and researchers. Postgraduate Students will make more use of the library if they have access to library resources. Library services are rendered to meet the information needs of users in the library. Libraries are the storehouse of knowledge where services like internet service, current awareness service, selective dissemination of information, reprographics service, bindery services, indexing and abstracting service, word processing and circulation of library information resources are rendered to users. However, in order to provide effective information services to enhance teaching, learning and research, it must endeavour to have adequate information resources. Resources are the materials that libraries acquire, catalogue, stock, and make available to their users, as well as use to provide various other services. However, the library renders numerous services to users, addressing their diverse needs, characteristics, and interest. Several library services have been identified as aiming at facilitating the research activities of postgraduate students, the most commonly provided services include

inter-library loan, indexing and abstract service, current awareness, micro text, library tour, library instructions, book selection for the general library collection, theses, dissertation, lending services, reservation, advisory services, literature searches, photocopying, document delivery and circulation services are one of the most vital services rendered by libraries in Nigeria to the users. These services are being rendered for the teeming population of users which constitute postgraduate students, lecturers and other potential users at large who are outside the academic environment such as the immediate community's members where the library is situated. The library renders these services by way of providing information resources that can cater for the needs of postgraduate students and lecturers. Moreover, Research activities means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalize knowledge. This includes, but is not limited to, designing research, directing research, performing experiments, enrolling research subjects, making decisions regarding eligibility to participate in research, participating in observational registry programs, analyzing or reporting research data, or submitting manuscripts concerning research for publication (Russell and Dlamini, 2019) cited by Okebukola 2019. However, these research activities includes identification the area of interest, identification problem, coining of topics/titles, consulting related literature, extracting of journals, articles, and conferences, and the interpretation and analysis etc.

Utilisation is the use of right information resources at the right time in effective way. However, the term "utilisation" is a verb that indicates an act of use a thing or phenomenon. The term "utilization" means to put something such as a tool, skill or building to a particular purpose. Also, it can be regarded as the act of getting the best out of something. To use something, be it a thing, phenomenon or situation, entails getting out the best out of the purpose for which that

thing, phenomenon or situation was created or established. Interestingly, the term use is relative, depending on the context in which it is applied. In the context of Internet, it entails having the ability to maneuver through the intricacies associated with it, while navigating in search of information for academics and other purposes, as intended by the user. Availability of information resources is about information being accessible as needed, when needed, where needed. The objective of availability is to enable access to authorized information or resources. A study by Ibrahim and Sakiyo (2022) confirmed high unavailability of library and information science (LIS) collections in most libraries and this had a negative effect on the use of information resources in the libraries studied. Achebe (2014), in their respective researches asserted that continuous library utilization has positive multiplier effect on the academic performance and self-development of any user. This is because some of the terms used in the library services, such as cataloguing, classification, charging and discharging, etc. are not common to the users, and therefore these terms should be interpreted in the easiest understandable ways (Olajide and Adio,2017). Nonetheless, an interesting observation is that there is an underutilization of the library facilities in most institutions (Chen 2022; Ibrahim &Sakiyo 2022), which is counterproductive to the goals and objectives of the library department with regard to enhancing access to information.

Digital libraries play a vital role in enhancing research activities for postgraduate students. Here are the importance/benefits of digital library to society especially to the postgraduate students are as follows:

1. Access to a Wide Range of Resources: Digital libraries provide access to a vast array of academic journals, books, and other scholarly materials that might not be available in traditional

libraries. This democratizes access to information, allowing students to explore diverse perspectives and the latest research in their field.

2. Convenience and Accessibility: Postgraduate Students can access digital libraries from anywhere and at any time, making it easier to conduct research without the constraints of physical library hours. This is particularly beneficial for distance learners or those with busy schedules.

3. Enhanced Research Efficiency: Digital libraries often come with advanced search functionalities, allowing students to quickly find relevant information. This can significantly reduce the time spent on literature reviews and data collection.

4. Collaboration and Sharing: Many digital libraries support collaborative tools that enable students to share resources.

However, the library forms the very core of higher institutions, where it acts as a brain. The best practice in libraries involves the optimum utilisation of space, service, and service visibility. Regulatory institutions such as the National Universities Commission (NUC), the National Board for Technical Education (NBTE) and the National Commission for Colleges of Education (NCCE), among others in higher education, are seriously concerned about how to improve the standards of academic libraries. Part of their concern is the issue of digital library services. Digital library services are those services that are delivered digitally through computer networks. However, digital library services are technologically oriented, requiring less space for storage with easy accessibility to users. The resources of digital libraries are accessible from any location across the world with core needs of electricity and network availability for the Internet. Computers have become the mode of delivering digital services to its consumers in comparison to conventional physical libraries in which human intervention is mandatory for normal

operations (Shem, 2019). On the other, hand Digital Library services according to Ya'u'(2020) are information access services in which patrons enquire answers through electronic means such as email or online forms. It is responsible for the provision of customer information services and the provision of access to various information resources as well as serving as digital preservation. The Digital Library Service manages and creates electronic services, library websites, and library staff (Bhatnagar, 2020). However, according to Gladeny (2019), digital library services are also varied but typically serve the same roles that traditional collection development and access services have in physical libraries: selection, specialization, and administration. Paltridge (2017) opined that digital library services can be provided digitally by physical libraries, and services provided by digital libraries. broadly grouped digital library services into seven groups. These services include the Online Public Access Catalog Service (OPACS), the Digital Theses and Dissertation Service (DTDS), the Digital Journal Service (DJS), the Digital Reference Service (DRS), the Digital Cataloguing and Classification Service (DCCS), the Digital Books Service (DBS), etc. A digital library provides value-added solutions for all higher education institutions. The digital library provides access to tools such as databases, electronic journals, alerting services, online reference tools, and quality-selected web resources that improve the quality of teaching and research (Tenant, 2019). This study focuses on the utilisation of digital library services for research activities by postgraduate students at Kashim Ibrahim Library (KIL). It is concerned with how digital library service utilisation influences the research activities of postgraduate students at Kashim Ibrahim Library (KIL), Ahmadu Bello University (ABU), Zaria.

The concept digital libraries (DL) can be understood in different ways using different names. An analysis of various definitions of digital libraries pointed out that digital libraries are

used interchangeably with electronic libraries, virtual libraries, and libraries without walls (Bawden and Rowland, 2019). Other terms include repositories of information products, computerized network library systems, and databases accessible through the Internet. All these terms point out the seamless characteristics of digital libraries. Another description sees the concept as libraries with the same purposes, functions, and goals as traditional libraries: collection development and management, subject analysis, index creation, provision of access, reference work, and preservation (Chore, 2020). The Digital Library Federation defines digital libraries as: Organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily available for use by a defined community or set of communities (Shiri,2021). The library is considered as physical or virtual of accumulated information for the digital users in any area of interest. After the invention of Internet, the library collections and services have witnessed dramatic changes (Raitt ,2020). Also digital library has an opportunity to address the scarcity of teaching and research materials in the libraries of institutions of higher education in Nigeria. An indigenous digital library would allow the institutions and indigenous researchers to share their own research outputs with the global community as well as ensure the preservation of Nigerian cultural heritages. in Russell and Dlamini (2019), cited by Okebukola 2019) argued that a digital library would improve the quality of teaching and research through the provision of current e-books, journals, and other library resources. It would also enhance scholarship, research and lifelong learning through the establishment of access to shared global digital archival collections. According to Hirsh (2020), the mission of digital library is to provide both information services and resources that are capable of meeting the research, teaching and learning needs of the faculty and students. Of

course, academic researchers see digital library as research centre and intellectual energy house where knowledge, ideas and directions are generated to achieve research goals of the university. Digital library provides library and information resources in electronic format other than print format and enhances searching of electronic collections distributed across networks, rather than merely creating electronic repositories from digitized physical materials. A digital library is a library in which collections are stored in digital formats (as opposed to print, micro form, or other media) and accessible by computers. The content may be stored locally, or accessed remotely (Arora, Trivedi & Kembhavi, 2021). The potential of digital library lies in its use of electronic wide area network in the library in which the users enjoy the euphoria of being in distance and still access library collection. The foregoing reveals that digital library eliminates physical boundaries of data storage, access, retrieval and dissemination of information to users within and across the globe with the use of internet connectivity (Akpoghome and Idiegbeyan 2021) cited by Danniell 2021) .

1.2 Statement of the Problem

The advents of Information and communication technologies (ICTs) has raised the standard of libraries as social institutions directed to the realization of both information access and cultural functions. However, with the advancement of technology, the issue of library as a physical space has begun to change in the last two decades, For example, library as a physical learning space, book stacks, reading room has experienced a paradigm shift with innovative services such as and technology leading to emergence of digital library. Digital Library Services (DLS) facilitates unlimited access to pool of relevant resources and 24 hours library services via portable digital devices anytime and anywhere, where digital library services are provided to access thousands of digital collections from diverse sources worth supporting quality research.

Researchers need such digital collection to accomplish their investigation in the 21st Century. Based on this quest for quality research, Ahmadu Bello University Zaria built a strong digital information service, examples are Open Access Institutional Digital Repository (IDR), Online Public Access (OPAC), Digital Reference Services (DRS), for the use of intellectual community. This digital information services has one of the best infrastructure and information content in West Africa.

According to Saidu (2023), in his article Assessment of Institutional Repository as a Tool for Enhancing Scholarly Communication and Visibility: A Case Study of Ahmadu Bello University, Zaria, revealed that the concept of Institutional Digital Repository (IDR) emerged from the open access movement, which advocates for free and unrestricted access to scholarly publications online. Institutional Digital Repository (IDR) are digital collections of the research output of an institution, such as journal articles, conference papers, theses, dissertations, reports, and datasets. IRs aim to collect, preserve, and disseminate the scholarly communication within and outside the institution, and to increase its visibility and impact. Institutional Digital Repository (IDR) also provide an opportunity to integrate and facilitate knowledge sharing among researchers, and to enrich the knowledge content of the institution.

Research activities are usually observed among both the postgraduate and undergraduate students of higher institutions of learning. This is part of academic requirement needed from postgraduate students before graduation. Research activities are necessary for the develop of the students, universities and countries at large. To achieve adequate research activities in various institutions, most libraries strive and equip their libraries with ICT gadgets as assist students have access to current information resources.

However, it is observed by the researcher that despite the ICT infrastructure such as digital library established or installed by ABU Zaria in KIL of the university postgraduate students use of their academic library still left much to be desired

In light of the aforementioned problems, this research was undertaken to assess the utilisation of digital library services for research activities by postgraduate students in kashim Ibrahim library Ahmadu Bello University Zaria.

1.3 Research Questions

The study sought to provide answers to the following research questions

1. What is the level of research activities of postgraduate students carried out in KIL, ABU, Zaria?
2. What is the means of accessibility of digital library services by postgraduate students of ABU Zaria, for research activities?
3. What research activities do postgraduate students utilise digital library services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria?
4. To what extent are postgraduate students satisfied with digital library services for research activities in Kashim Ibrahim Library, Ahmadu Bello University, Zaria?
5. What challenges are faced by postgraduate students in utilising digital library services for research activities in Kashim Ibrahim Library, Ahmadu Bello University, Zaria?

1.4 Objectives of the study

The objectives of the study are as follows:

1. To find out the level of research activities of postgraduate students carried out in KIL, ABU, Zaria
2. To identify the means of accessibility of digital library services by postgraduate students of ABU Zaria, for research activities

3. To identify means of accessibility of digital library services by postgraduate students of ABU Zaria, for research activities
4. To determine the extent of postgraduate students' satisfaction derived from utilising digital library services for research activities in Kashim Ibrahim Library, Ahmadu Bello University, Zaria.
5. To find out the challenges faced by postgraduate students while utilising digital library services for research activities in Kashim Ibrahim Library, Ahmadu Bello University, Zaria.

1.5 Significance of the Study

The beneficiaries of the study are as follows; the postgraduate students, university library, Future Researchers. The Postgraduate students will benefit from digital library services in such a way that, it will offer the capability to search for desired information by subject area, to have access to scientific data sets, to interact with peers, to provide archiving, location-independent naming, recommend systems, selective dissemination of information, and copyright management. Faculty, students, and other clients such as independent learners will be able to participate in forums.

The university management can also benefit effective and efficient linkage digital libraries needs to be recognized by senior management in the long-term strategic planning of the individual institutional mission, identifying their own specific cultural, social and educational requirements. The digital library serves mainly as a facilitator in organizing and providing knowledge and resources to its users.

The university's management will also benefit. Effective and efficient linkage between e-learning environments and digital libraries need to be recognized by senior management in the long-term strategic planning of the individual institutional mission,

identifying their own specific cultural, social and educational requirements. The digital library serves mainly as a facilitator for organizing and providing knowledge and resources to its users.

This study will benefit future researchers by providing academic researchers with electronic access to national and international scholarly journals. These journals span wide areas of natural and physical sciences, social sciences and humanities, and address a long-standing need of the university community for access to scholarly publications for effective research and development activities in the universities. University e-library plays prominent roles in promoting research in academic environments through provision of wide arrays of researchable information resources, mechanized access and retrieval information system. Having all the research articles, abstracts, thesis, dissertations, conference proceedings, textbooks, indexes and other reference materials, students and academic staff tend to produce a better and more quality research project timely and with relative ease.

Finally, this study will add to the existing body of literature in the field of Library and Information Science.

1.6 Scope of the Study

The study focused on the utilisation of digital library services for regular postgraduate students was considered because they undergo services of research activities/theses and dissertation in Kashim Ibrahim Library, Ahmadu Bello University, Zaria from 2021/2022 academic session. The study covered (13) thirteen faculties, in Ahmadu Bello University, Zaria. The faculties are; Faculty of Arts, Faculty of Administration, Faculty of Agriculture, Faculty of Education, Faculty of Engineering, Faculty of Environmental Design, Faculty of Law, Faculty of Life Sciences, Physical Sciences, Health Science (Clinical Sciences), Pharmaceutical Sciences, Faculty Social of Science, and Faculty of Veterinary Medicine.

1.7 Operational Definition of Terms

The following terms were defined operationally within the context of this study:

Digital libraries (DL): are the libraries where all the services are fully automated and the resources are stored in digital form, available in KIL, ABU, Zaria.

Digital Library Service (DLS): these are the services that are delivered digitally to postgraduate students in KIL, ABU, Zaria through computer networks such as digital journal services, OPACS service, digital classification and cataloging service, digital selective dissemination of information service, digital reference service, and digital theses and dissertations service, etc.

KIL: Kashim Ibrahim Library

postgraduate student (PG): is any person or individual who is studying for a higher degree program who uses digital library in KIL, ABU, Zaria.

Research activities: are set actions done by postgraduate students in carrying out their research, like the identification of areas of interest, problem identification, coining of a topic or title, conducting of related literature, conducting analysis and interpretation, extracting journal articles/conferences, etc.

Services: are set of activities carryout by digital library staff to address information needs of the postgraduate student in KIL, ABU, Zaria.

Utilisation: to use the right Information resources at a right time in an effective way by the postgraduate student in KIL, ABU, Zaria.

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CHAPTER TWO REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter presents the review of related literature organized under the following sub headings in the chapter:

2.2 Concept of Digital Library Services

2.3 Level of Research Activities by Postgraduate Students

2.4 Types of Digital Library Services Available for Postgraduate Students

2.5 Importance of Utilisation of Digital Library Services for Research Activities

2.6 Access to Digital library Services Available for Postgraduate Students

2.7 Research Activities Performed by Postgraduate Students Utilising Digital Library Services

2.8 Extent of Satisfaction with Digital Library Services by Postgraduate Students

2.9 Challenges faced by Postgraduate Students in Utilising Digital Library Services for Research Activities

2.10 Review of Empirical Studies

2.11 Summary of the Review

2.2 Concept of Digital Library Services (DLS)

Digital library services are those services that are delivered digitally through computer networks. However, digital library services are technologically oriented, requiring less space for storage with easy accessibility to users researchers. The resources of digital libraries are accessible from any location across the world with core needs of electricity and network availability for the Internet. Computers have become the mode of delivering digital services to its consumers in comparison to conventional physical libraries in which human intervention is mandatory for normal operations (Shem, 2019). On the other hand digital library services

according to Ya'u' (2020) are information access services in which patrons enquire answers through electronic means such as email or online forms. It is responsible for the provision of customer information services and the provision of access to various information resources as well as serving as digital preservation. Digital Library service manages and creates electronic services, the library websites and library staff (Bhatnagar, 2020).

Gladeny (2019) stated that digital library services are also varied, but typically serve the same roles that traditional collection development and access services have in physical libraries: selection, specialization and administration. Paltridge (2022) opined that digital library services can be provided digitally by physical libraries, and services provided by digital libraries. broadly grouped digital library services in seven groups. One that provides services with intervention of librarian like alerting service, digital reference services, SDI, CAS etc. and the other research which covers technical aspect of digital library services like metadata, harvesting system, ontology, improvising search engines. It maintains all, or a substantial part of its collection in computer accessible form as an alternative, supplements, or complements to the conventional printed and micro-form materials currently dominated library collection. However, Deshpande (2018) described digital library services as Electronic/Digital information services that provide CD-ROM facilities; electronic transmission of documents; maintaining of on-line subscriptions and purchase; access to online periodicals, including free online journals; E-mail and electronic alerts from publishers of journals and handling of websites and databases". A digital library service also includes Online Public Access Catalogue Service (OPAC), Document Delivery Service, Online classification Service, Online cataloguing Service, Digital Reference Services, and institutional repositories, etc.

In summary Computer networks enable the delivery of digital library services, providing easy accessibility to users worldwide. These services, requiring minimal storage space, require only electricity and internet connectivity, transforming the traditional physical library experience.

2.3 Level of Research Activities by Postgraduate Students

The level of research activities carried out by postgraduate students at Ahmadu Bello University (ABU), Zaria, is quite robust and diverse which includes Research Focus on Collaborative Research: ABU has signed agreements with other institutions, such as the University of Nairobi, to collaborate on joint research activities. This includes the exchange of scholars and students, which enhances the research experience and exposure for postgraduate students. Research projects for postgraduate students are required to undertake and complete research projects, seminars, dissertations, or theses as part of their programs. These projects cover a wide range of topics and are essential for the completion of their degrees. Support and resources from directorate of research and innovation at ABU coordinates research activities across the university, providing support and resources to postgraduate students. This includes managing research policies, providing information, and facilitating collaborations. Facilities and resources the library offers extensive resources and services to support research activities. This includes access to a vast collection of books, journals, and electronic resources, as well as training on efficient utilisation of these resources. The research output for publications and conferences, postgraduate students are encouraged to publish their research findings and present them at conferences, seminars, and workshops. This not only enhances their academic profiles but also contributes to the broader scientific community. Overall, the research activities of

postgraduate students at ABU, Zaria, are well-supported and geared towards producing high-quality research that addresses societal needs and contributes to academic knowledge.

2.4 Types of Digital library Services available for Postgraduate Students

Plenty a number of Digital Library Services are available to provide a guide for postgraduate students to access relevant information resources are as follows;

Digital Cataloguing and Classification Service (DCCS)

Cataloguing can be defined as “the process of creating entries for a catalogue” Reitz (2019). The author further opined that cataloguing involves "bibliographic description, subject analysis, assignment of classification notation, and all the activities involved in physically preparing the item for the shelf, tasks usually performed under the supervision of a librarian trained as a cataloguer”. Cataloguing according to Ya’u’ (2020) is a forerunner of classification, and one does not go in isolation of the other, which made Taylor and Joudrey in Unegbu (2020) to stated that classification of information resources is part of the process of cataloguing, and usually the first activity to occur as new resources are received in the library. Cataloguers in the digital age are contending with various forms of cataloguing and classification like 'original cataloguing, cooperative and centralized cataloguing, with its varied manifestations involving 'quality cataloguing, copy cataloguing, online cataloguing, online public access catalogue (OPAC) and outsourcing', among others (Shem, 2019). Ekere and Mole (2021) maintained that original and copy cataloguing are the major forms, while the others are derivatives. Quality cataloguing implies application of standards or rules of cataloguing to cataloguing practice. It requires emphasis on maintenance of cataloguing rules. Khochar (2019) opined that quality control involves attention to all positions in cataloguing department even to the lowliest, as quality work in one area can be negated by sloppiness in another. Thus, Unegbu (2020) opined

that in order to have uniformed system of representing bibliographic features of any information resource, different subject heading lists emerged, and the most popular ones are the Library of Congress Subject Heading List and Sears List of Subject Headings, and each is used depending on the classification system adopted by a particular library. All these efforts are geared towards making information resources easily accessible and retrievable in order to serve the clientele better and faster. Original cataloguing can be defined as a process whereby cataloguers prepare bibliographic records of information resources from the scratch. According to Reitz (2019), it is done without the use of a pre-existing catalogue record for that information resource. Original cataloguing is also defined by Lisiwiki (2022) as creating a catalogue record for an item without the aid of an existing library record, which requires good training and apprenticeship; proficiency both in descriptive cataloguing and in subject cataloguing, and familiarity with the cataloguing tools. Unegbu (2020) noted that the emergence of online cataloguing has resulted in many libraries discouraging their cataloguers from practicing original cataloguing, as original cataloguing is presumed to be tasking and requires intelligent and articulate persons with adequate skills, knowledge and experience. However, original cataloguing should take precedence in cataloguing, as it encourages mentorship so as to ensure that at every point in the cataloguing and classification unit, seasoned cataloguers that would mentor others are found. Copy cataloguing according to Reitz in Unegbu (2019) is defined as the adaptation of a pre-existing bibliographic record to fit the characteristics of the item being processed, “with modifications to correct obvious errors and minor adjustments to reflect locally accepted cataloguing practice”. Cerbo 11 in Nwosu (2019) averred that online cataloguing and classification on the web have improved cataloguers work output as library resources are processed faster using appropriate software. Cataloguers who catalogue online do some

modifications peculiar to their own library needs. However, since there are many national publications that are not online, original cataloguing still becomes indispensable. Thus, Hixson in Unegbu (2020), advised cataloguers at the University of California, Los Angeles “to adhere to stricter qualitative standards than copy cataloguing because original records are shared with thousands of other libraries.

From the above definitions Cataloguing is the process of creating entries for a catalogue, involving bibliographic description, subject analysis, classification notation, and physical preparation. It is a precursor to classification and is the first activity to occur as new resources are received in libraries. In the digital age, cataloguers face various forms of cataloguing and classification, including original cataloguing, cooperative and centralized cataloguing, quality cataloguing, copy cataloguing, online cataloguing, online public access catalogue (OPAC), and outsourcing. However are gateways to information resource access and utilization, as they are means of organizing library resources that are easily accessible to library users. And also are the two interrelated practices performed with computers in the library to aid users of the library in finding and selecting appropriate information resources needed for study and research.

Online Public Access Catalogue Service (OPAC)

Another form of online cataloging is the use of other libraries online public access catalogs (OPAC) in cataloging and classification practices. An online public access catalog (OPAC) can be defined as a computerized library catalog. Salawu (2020) viewed it as a database of bibliographic records describing the information resources in a library that are accessible to the public through public terminals. It is noted that with the emergence of the Internet, most libraries have made their OPAC accessible from a server to users and other libraries globally. The author equally maintained that as a result of the availability of call numbers that are

displayed for accessibility through OPAC, it has become a standard form of bibliographic access globally, and databases are built based on it. Thus, the WWW has enabled libraries to make their catalogs freely available to a wider audience and serves as an online cataloguing tool for catalogers, thereby enhancing bibliographic control. ` Outsourcing is defined by Reitz (2019). Another form of online cataloguing is the use of other libraries online public access catalogue (OPAC) in cataloguing and classification practices. Online public access catalogue (OPAC) can be defined as a computerized library catalogue. Shariful (2020) viewed it as a database of bibliographic records describing the information resources in a library that are accessible to the public through public terminals. It is noted that with the emergence of the Internet, most libraries have made their OPAC accessible from a server to users and other libraries globally. The author equally maintained that as a result of the availability of call numbers that are displayed for accessibility through OPAC, it has become a standard form of bibliographic access globally, and databases are built based on it. Thus, the WWW has enabled libraries to make their catalogues freely available to a wider audience, and makes it serve as an online cataloguing tool for cataloguers, thereby enhancing bibliographic control. ` Outsourcing is defined by Reitz (2019) as “the contracting of library services formerly performed in-house to an outside service provider, usually a for-profit enterprise. Though there are many divergent views regarding outsourcing, Sloan (2020) noted that it is necessary when there are backlog of information resources to catalogue; and could be adopted during accreditation exercise in academic libraries. Outsourcing could also be adopted during processing of information resources for production of national bibliography; it is also necessary when there is inadequate fund to engage adequate permanent staff in the library. The author however, suggested that outsourcing of cataloguing practices of any library should not be encouraged on a regular basis in the library profession, so as not to

compromise professionalism. Online public access catalogs service (OPACS) are computerized databases of bibliographic records accessible to the public through public terminals. With the emergence of the Internet, most libraries have made their OPAC accessible from a server to users and other libraries globally. The availability of call numbers for accessibility through OPAC has made it a standard form of bibliographic access globally, and databases are built based on it. The WWW has enabled libraries to make their catalogs freely available to a wider audience and enhance bibliographic control. The online public access catalogs service (OPACS) is designed to the following functions; To provide access to literature available in the library, to provide multi-points and multi person access, to tell about, what books have been lent, and what books are stock in the library.

From the above definitions Online public access catalogs (OPAC) are computerized databases of bibliographic records accessible to the public. With the rise of the internet, libraries have made their OPAC accessible globally. This has made them a standard form of bibliographic access, enabling libraries to make their catalogs freely available and enhance bibliographic control. Outsourcing is also a key aspect of this process.

Digital Selective Dissemination of Information Service (DSDIS)

Omehizor, (2020) in the field of librarianship, dissemination of information to primary customers is a basic function of a library. It is the responsibility of the library and the librarian to disseminate information for study, teaching and research. Therefore, students, faculty and researchers are entitled to be informed of newly acquired information resources and that they will be able to fully utilize them. One method for addressing this problem is through e-Selective Dissemination of Information Service (e-SDI). It is a system that attempts to facilitate users' information retrieval and filtering. Akhar, (2019), It is an information alerting service designed to keep individuals informed of new developments in their particular fields of interest by

providing at regular intervals a listing of citations. The goal is to deliver new information to users via library blog, library website, social media, text messaging, emailing and others. Clearly, e-SDI could give great benefit to users like saving the users time and effort and allowing them to concentrate on the specific information which relates to their interests. Library services are responsible for disseminating information for study, teaching, and research. One solution is e-Selective Dissemination of Information Service (e-SDI), which facilitates users' information retrieval and filtering. This alerting service keeps users informed about new developments in their fields of interest, delivering new information via various channels. e-SDI saves users time and effort, allowing them to focus on their interests.

From the above definitions Library librarians are responsible for disseminating information for study, teaching, and research. e-Selective Dissemination of Information Service (e-SDI) is a system that facilitates users' information retrieval and filtering. It provides regular updates on new developments in their fields of interest via various channels, saving time and effort. e-SDI allows users to focus on specific information related to their interests, enhancing their overall library experience.

Digital Reference Service (DRS)

Digital reference services are Internet-based question-and-answer services that connect users with experts and subject expertise. Digital reference services use the Internet to connect people with people who can answer questions and support the development of skills. Sloan, (2020), the provision of real-time personal assistance to users via web-based interactive software to satisfy the information need, the librarian can "chat" as a component of the software to answer a fairly specific or simple question, or deliver digital materials, or suggest relevant web resources to the user, and provide online bibliographic instruction. This service may happen when the

library is closed, or when the user is unable to get to the library. This way, users can still be in contact with experienced reference librarians. Questions submitted via email and linked web pages require attention from reference staff, and the virtual reference transaction can be more complex and time-consuming than traditional in-library service. The Web medium that poses a new challenge for librarians offers major new tools to give us the power to control our own situation.

From the above definitions digital reference services connect users with experts and subject expertise through the web. These services provide real-time personal assistance, digital materials, and online bibliographic instruction. They can be accessed during library closures or when users cannot physically visit the library. The web medium offers new tools for librarians, allowing users to control their situation and access resources while addressing complex questions.

Digital Document Delivery Service (DDDS)

Libraries actualize ICT-based inter-library loaning framework using electronic systems for records conveyance. Fundamentally, the Digital Document Delivery Service (DDDS) empowers a library to utilize duplicates of research papers or other research report, from different libraries. These records could be diary articles or different archives in computerized design. They are essentially in Portal Document Format (PDF) and they conveyed to library clients' work areas. According to Online Dictionary of Library and Information Science Digital Document Delivery Service (DDDS) is the transfer of information traditionally recorded in a physical medium (print, videotape, sound recording, etc.) to users electronically via e-mail, or World Wide Web? The libraries employ digital technology to deliver the information contained in the documents files placed on reserve and requested via inter library loan.

From the above definitions the library utilizes the Digital Document Delivery Service (DDDS) for records conveyance, enabling the transfer of duplicates of research papers or reports

from different libraries in PDF format. This inter-library loaning framework utilizes electronic systems to deliver information electronically, eliminating the need for physical mediums.

Digital-Journals Service (DJS)

Electronic journals service form a large part of the collection of a library for providing web based services. A lot of journals are available in electronic form of which some are full text and some include just bibliographic information with abstract. The main advantage of electronic journals over the print one is that they are always updated and easy to access but the challenge which could also be regarded as the disadvantage is that breaching of copyright law is very easy. They are available in various electronic formats such as PDF, ASCII, bitmaps, Postscript, SGML and HTML. Library services may be delivered to patrons via CD-ROM, email or just through the web. Some societies and associations both locally and internationally have converted their own contents into digital format and develop digital libraries through which users can get access to all their publications such as newsletters. The services are made available to the members of society or associations by subscription.

From the above definitions electronic journals form a large part of library collections, offering easy access to updated, easy-to-access content in various formats like PDF, ASCII, bitmaps, Postscript, SGML, and HTML. However, copyright law breaches are easy. Library services can be delivered via CD-ROM, email, or the web, and some societies and associations have converted their content into digital formats for subscription.

Digital Book Service (DBS)

A digital book service refers to platforms or systems that provide access to digital versions of books, often called e-books. These services allow users to read books on various

digital devices such as tablets, smartphones, and e-readers. However e-books is a book in electronic or digital form. Digital libraries are providing books in electronic form which can be read on the screen and download them in Portal Document Format (PDF) for study, teaching, learning and research purposes. However, e-books are digital books available for study, teaching, learning and research in Portal Format (PDF) through digital libraries. Here are key points about digital book services;

1. Accessibility: Users can access a wide range of books from anywhere with an internet connectivity.
2. Portability: Digital books can be store on devices, making it easy to carry multiple books without the physical bulk.
3. Features: Many services offer features like adjustable font sizes, search functions, best sellers, classics and niche genres.
4. Cost-Effectiveness: Some services offer subscription models, allowing unlimited access to a large number of books for monthly free. Examples of popular digital book service include Amazon Kindle, Apple Books and Google Play Books.

Digital Theses and Dissertations Service (DTDS)

The Digital Theses and Dissertations Service (DTDS) typically refers to platforms that provide access to electronic versions of academic theses and dissertations. These services aim to promote the creation, dissemination and preservation of scholarly work. However, libraries are now providing theses and dissertation online via digital repositories. They do this by converting the hard copies or asking postgraduate students to submit their research works in CD-ROM. Deshpande (2019) recognized a portion of the ICT-based services that are giving by libraries. Libraries offer digital theses and dissertations services, converting hard copies or requesting CD-

ROM submissions, a part of ICT-based services recognized. Here are key features of such services:

1. Accessibility: They provide global access to a vast collection of theses and dissertations.
2. Preservation: They ensure the long-term preservation of academic research works.
3. Searchability: Users can search for specific topics, authors, or institutions.
4. Open Access: Many services offer open access to their collections, making research works freely available to the public.

2.5 Importance of Utilisation of Digital Library Services for Research Activities

Utilising digital library resources is crucial for enhancing research activities. The importance of utilisation of digital library services for research activities of postgraduate students as per Chore & Salwe (2019) are as: Preservation of the precious records, exceptional and extraordinary compilations of libraries, archives and museums, guarded informational sources, provision of downloading as well as printing, provision of fast accessibility to the assets of libraries which are universally located by means of automated enhanced catalogues, helping in locating physical as well as digitized accounts of scholarly articles and books by means of solo interface, optimization of search, possibility of concurrent investigations on the internet, preparation of commercial databases, and library collected works, Provision of cross references for further records, reducing the chain of author to the final user, saving of preparation or saving price, space and funds, management of digital technology in providing access to numerous, concurrent users from a solo origin which not at all feasible with resources and documents saved in any other formats and full text search. Furthermore, Warr & Hangsing (2020) highlighted few of the main importance of digital libraries as removing physical peripheries the consumer of the digital library is not required to visit the library in a physical form and people or groups of

people can get access to the similar data, provided that the internet connection is readily available. Accessibility at all time to users can get data accessibility irrespective of the time and round the clock. Many accesses at a time, same data or sources are accessible to multiple users at the parallel time leaving no scope of shortage of knowledge. An organized approach: digital libraries has the benefit of providing accessibility to a more affluent information and that too in a much better organized format which means that one can conveniently shift from the record to the specific book then to a specific chapter and so on. Recovery of information to postgraduate students accessing digital libraries are capable of using any search term (word, phrase, title, name, subject) for searching the complete collection, digital libraries can offer extremely useful user friendly interfaces, through clickable accessibility to its content. Protection and maintenance of: Space- As the conventional libraries were restricted from storing information, the advantage of digital libraries is storing a great amount of information, just because digital data needs extremely less physical storage space to hold them. Networking a specific digital library has the provision of associating with to every other resource of further digital libraries in a convenient way; therefore a faultlessly incorporated resource sharing is feasible due to digital library. However, accessibility 24/7 access to digital libraries provide round-the-clock access to a vast array of resources, allowing researchers to work at their convenience. Remote access to researchers can access materials from anywhere, which is especially beneficial for those who cannot physically visit the library. Comprehensive resources for diverse collections to digital libraries offer a wide range of resources, including e-books, journals, databases, and multimedia content. Up-to-date information they provide access to the latest research and publications, ensuring that researchers have the most current information. Efficiency searchability advanced search functions make it easier to find specific information quickly, saving time and effort.

Enhanced research productivity to increased output, studies have shown a positive correlation between the use of digital library resources and research productivity. Support for innovation; access to a broad spectrum of information can inspire new ideas and innovations in research. Preservation and sustainability digital preservation, digital libraries, help preserve rare and fragile materials by providing digital copies, ensuring long-term access. Environmental Impact; reducing the need for physical copies helps lower the environmental impact associated with printing and shipping. Overall, the utilisation of digital library resources significantly enhances the efficiency, accessibility, and quality of research activities and making them an indispensable tool for modern researchers.

2.6 Access to Digital Library Services Available for Postgraduate Students

With the presence of Internet and WIFI within and around the University Library, (Kashim Ibrahim Library, Ahmadu Bello University, Zaria), registered Postgraduate students had access to Internet resources without entering the Electronic Library through the link to the library home page:<https://library.abu.edu.ng>. More so, users find it more convenient using search engines which gave them access to Internet resources. It is possible that the convenience of access to Internet resources through search engines minimized the utilisation of digital library services by postgraduate students in Kashim Ibrahim Library. However according to Komolafe-Opadeji (2019) who discovered that postgraduate students regularly access the Internet and preferred the use of free online resources from Google and Wikipedia to subscribed online databases like HINARI, EBSCOHOST, JSTORE, AGORA, IEEE Advance Technology for Human, SCIENCE DIRECT, OARE, EMERALD INSIGHT (PUBLISHING) and TEEAL (LIBRARY IN BOX). On-site visit to the Library record revealed that, the Library had access to the following databases: Ebscohost, Science Direct, Nigerian Virtual Library, Nexis Lexis,

Dialog Database, Datastar Database, HINARI, AGORA, TEEAL, OARE, ACM, OAPEN, OAJSE, AJOL, SAGEOPEN, Springer Open and ARDI. The University of Ahmadu Bello University Library website had access link to HINARI, AGORA, EBSCOHOST, TEAL, Nigerian Virtual Library and Science Direct. However, as at the time of the visit, the Library had access only to Science Direct, Nigerian Virtual Library, HINARI, OARE, and TEEAL, AGRIS: Agricultural database (Agriculture), Analytical Sciences digital library (Analytical Chemistry), Anthropological Index Online (Anthropology), Astrophysics Data System (Astrophysics, Geophysics, Physics), BASE: Bielefeld Academic Search Engine (Multidisciplinary), Bioinformatic Harvester (Biology, Bioinformatics), ChemXSeer (Chemistry), Citebase Search (Mathematics, Computer Science, Physics), CogPrints: (Science General), DBLP Computer Science bibliography (Computer Science), EconBiz (Economics), ERIC: Education Resource Information Centre (Education), GoPubMed (Medicine), National Criminal Justice Reference Service (Criminology, Sociology), WorldWideScience (Multidisciplinary), Philosophy Documentation Center e-Collection (Philosophy), VET-Bib (Social Science, Education), WIDERNET: (Multidisciplinary), Others include Free E-books Area: bookboon.com, Bookzz.org, OAJSES.com, Freefullpdf.com, <http://gen.lib.rus.ec>, <http://free-books.us.to>, <http://ebookfi.org>, <http://libgen.io>, pdfdrive.net PDF Drive is your search engine for PDF files. We have more than 90,961,165 e-Books for you to download for free. No download limits, enjoy it and don't forget to bookmark and share the love. . Library website has become a significant aspect of the higher educational institutions. It becomes difficult for users to access and retrieve information if the website is not properly designed. Therefore, library website needs to be user friendly in design, access and use. That helps in growing its (website) usability (i.e. the ease at which an average person can use the website to achieve specific goals) which is considered as

one of the most important aspects of designing a website (Cappel & Hung, 2021). Moreover, academic library websites believed to provide information as well as access to several services (online catalogues, electronic databases, digital collections, different library tutorials of the institution whom they are associated with). Thus, academic library websites act as gateways to information for faculty members, research scholars, students etc.

Through which users can ask reference questions online, conduct research in databases, place inter library loan requests online, and obtain academic articles electronically (Cohen & Still, 2019). But website should be designed in such a manner so that it can appeal as much as users, it must provide easy access to required and relevant information through its homepage.

Library website goals should be, to establish clear site navigation and organization, to enable content management system, to develop a unified institutional visual identity throughout the site, and to utilize user centered categorization (Turnbow, Kasianovitz, Snyder, Gilbert & Yamamoto, 2020). Library websites play an important role in academia. Advancements in technologies like the World Wide Web (WWW) permit users to exploit the potential of various learning and communication tools in a more effective manner. Even in recent years, library services provided through the internet and computers brought numerous opportunities (Liu and Briggs, 2019). Especially in educational (higher) institutions library website (s) has an important role to play, as it (library website) is a virtual public face, which acts as the path to the collections, services and is used as a window to the World Wide Web (WWW). As a result, more libraries move towards providing services in a web environment, by making electronic information resources more realistic and more attractive that improves access to remote library collections. Apart from this, academic library website pages can be classified into: homepage, directional: library hours and policy; reference: collections and resource guides; and combination

(Hightower et. al., 2019). In fact, a library website (academic or public) facilitates its users to connect with the library 24 hours a day. “Today it is possible for student to conduct research for papers without ever stepping in the academic library. They can ask reference questions virtually; conduct research in databases; and place inter library loan requests electronically. All of these functions utilize library websites, requiring those websites to be timely and easy to use” (Connell, 2019). Also, these (websites of libraries) provides virtual library guide to the physical facilities including collections, services and infrastructure available in the library. Along with the web-based user education that provides a high degree of interactivity and flexibility to the users. In addition to this, some library web sites have some web forms for suggestions and comments on the library Services that may be helpful in acquiring some publications, inter-library loan request form for document delivery, Ask-a-Librarian forms, on line reservation form or user survey form etc. (Bhatnagar, 2020). In order to remain relevant with needs of users (faculty members/ students) believed to more regularly to expand information searches to include the collection of other libraries. In fact, faculty members were found requesting inter library loan through there library website in most of the academic institutions (Dickenson, 2021).

From the above discussions, the Kashim Ibrahim Library at Ahmadu Bello University in Zaria offers digital library services to registered postgraduate students through link to the library home page:<https://library.abu.edu.ng> with internet connectivity and WIFI. Students prefer using search engines for access to internet resources, but also subscribe to subscribed online databases like HINARI, EBSCOHOST, JSTORE, QUESTIA, and HIGH BEAM. The library has access to various databases, including Ebscohost, Science Direct, Nigerian Virtual Library, Nexis Lexis, Dialog Database, Datastar Database, HINARI, AGORA, TEEAL, OARE, ACM, OAPEN, OAJSE, AJOL, SAGEOPEN, Springer Open, and ARDI. The library website needs to be user-

friendly for easy access and use, as it provides information and access to services like online catalogues, electronic databases, and library tutorials.

2.7 Research Activities by Postgraduate Student Utilising Digital Library

Digital library has become an integral part of academic research activities. It provides academic researchers with electronic access to national and international scholarly journals. These journals span wide areas of natural and physical sciences, social sciences and humanities, and address a long-standing need of the university community for access to scholarly publications for effective research and development activities in the universities. Okerson (2019) posits that digital library is a place of hope and adventure for every sort of searcher after knowledge. It is a place where people and ideas meet and new ideas are ignited, making possible new relationships and new possibilities. University e-library plays prominent roles in promoting research in academic through provision of wide arrays of re-searchable information resources, mechanized access and retrieval information system. Having all the research articles, abstracts, thesis, dissertation, conference proceedings, textbooks, index and other reference material, students and academic staff tend to produce a better and more quality research project timely and with relative ease. Impact of digital library on research according to Trivedi (2022) includes provision of access to large amounts of information to users wherever they are and whenever they need it, access to primary information sources, support multimedia content along with text network accessibility on Intranet and Internet, user-friendly interface, hypertext links for navigation, client-server architecture.

The assertion holds credence to the fact that an academic institution is a center for learning, discoveries, finding solutions to societal problems, national developments, cultural

values, and character molding. Therefore, the quality and number of research publications of academic researchers reflect their research productivity. Kendagor, Kosgei, Tuitoek, and Chelangat (2020) opine that the research activities of academic researchers in academic institutions are determined by the number and quality of articles published by the affiliated faculty. Research productivity in universities reflects the active engagements of academic researchers. Research productivity of academic researchers is the totality of publication output in terms of articles published in peer review journals, conference proceedings and book chapters aimed at contributing to the existing body of knowledge. The quality and quantity of research publications by the academic researchers in universities are essential for their performance evaluations, promotions, securing tenure or permanent appointment, research grants, status enhancement, recognition, and other benefits. Perhaps, to ensure effective research productivity in universities, academic researchers must make effective use of reliable information resources. University e- library, according to Kesavan (2019) was adopted to increase access to resources and facilitate new research; mechanize conservation, preservation and add value to the collection of the parent organization; offer consistent access and retrieval of online resources, give flexibility, provide enhanced capabilities for analysis and manipulation of information or data and to “save the time of the users”; support e-learning and online research; supplement traditional print resources, and integrate multimedia library resources on a common platform; to increase productivity, and provide better service to users; to make collections accessible to 6 concurrent users; and to deliver a complete and complex round-the-clock set of aggregated information services irrespective of users’ location. The objective of university e-library is limited if access and retrieval of e-resources and services are ineffective. However, access to and retrieval of digital information resources has remained one area of growing concern for e-

librarians. According to Taylor and Francis (2019) pointed out areas in which improvement and innovation are needed to facilitate access to and retrieval of e-resources.

From the above definitions, digital libraries have become crucial in academic research, providing researchers with access to national and international scholarly journals across various fields. They serve as a platform for knowledge discovery and innovation, fostering relationships and possibilities. The digital library plays a significant role in promoting research by offering a wide range of re-searchable resources, mechanized access, and a user-friendly interface. The quality and quantity of research publications by academic researchers are essential for their performance evaluations, promotions, tenure, research grants, status enhancement, and recognition. To ensure effective research productivity in universities, researchers must make effective use of reliable information resources. The impact of digital libraries on research is significant, as they contribute to the overall learning and development process in academic institutions.

2.8 Extent of Satisfaction with Digital Library Services by Postgraduate Students

User satisfaction with electronic resources and found a significant positive relationship between User Satisfaction and the use of Electronic Resources Kadir, Ghani, Bakar, Bunawan, and Seman (2021). Also, Users' Satisfaction with ICT-Based Resources and Services in University Libraries at the Igbinedion University Library, Okada, Edo State, Nigeria. He found that students at Igbinedion University were satisfied with the use of ICT-based resources and services, especially the use of online database resources, in meeting their information needs in the university library Egharevba (2020). Similarly, Evaluation of Usage and User Satisfaction on Electronic Information Resources and Services: A Study at Postgraduate Institute of Medicine Library, University of Colombo. His findings indicate that 60.2% of the respondents were very

satisfied with the provision of Internet access in the library; they were also satisfied with the level of subscribed e-journals Sritharan (2019). However, the author identified lack of time to access e-journals at the library, lack of training, non-availability of remote access for subscribed resources as significant issues associated with electronic information resources and services in the university library. Furthermore Users` Satisfaction with Library Information Resources and Services: A Case Study College of Health Sciences Library Niger Delta University, Amassoma, Nigeria and found that library users were satisfied with the lending services of the library, renewal of library materials and longer hours of internet services in the library Tiemo and Ateboh (2022). On the other hand, his study revealed that users were dissatisfied with the limited reference materials in their various subject areas, national and international journals because they were not up to date.

From the above studies, the study found a positive relationship between user satisfaction and electronic resources, particularly online databases. Students at Igbinedion University Library in Nigeria were satisfied with ICT-based resources, but faced issues like lack of time, training, and remote access. The Postgraduate Institute of Medicine Library in Colombo had high satisfaction with internet access and subscribed e-journals. The College of Health Sciences Library in Nigeria had satisfactory lending services, renewal of materials, and longer internet hours. However, users were dissatisfied with limited reference materials and outdated journals.

2.9 Challenges Faced by Postgraduate Students in Utilising Digital Library Services for Research Activities

Despite the overwhelming advantages of digital library services, users still face some challenges with the use of digital library services. A number of studies have investigated students' challenges with the use of digital library services. A number of studies have

investigated students' challenges on the use of digital library services (Odeh and Akpokurerie, 2020); Igbo and Imo, 2022). These challenges have been identified as poor information technology infrastructure development Shariful, (2020); lack of knowledge on how to use e-journal, lack of facilities, lack of time and awareness (Sabouri and Nyumba, 2019); large mass of irrelevant information, the need to filter the results from search, download delay, failure to find information, inadequate or lack of search skills, high cost of access, inaccessibility of some digital information resources and difficulties in navigating through digital resources (Salaam, 2020; Omosekejimi, Eghworo and Aliyu, 2021); lack of awareness, insufficient bandwidth, high cost of internet connectivity and lack of digital information resources (Igbo and Imo, 2022); inadequate computer systems, slow internet speed and poor network service (Kosgei and Leosgies, 2020); frequent power failure, poor internet connectivity, improper guidance on use of electronic resources, non-payment of subscriptions and lack of personal computers (Tylor, and Francis, 2019) and slow downloading and blockage of websites (Akhar and Ahmad, 2021). Academic libraries and other libraries in Nigeria are most especially faced with the challenge to upgrade their systems in this era of digitization. Lecturers and students from all discipline and of course all library users demand easy access to information and the internet has become a viable asset to all and sundry. Academic librarians can proffer a lasting solution through their support to the lecturers and researchers of higher institution and assistance to students through the provision of adequate and timely information resources, with conducive platform for maximum utilisation.

According to Ya'u (2020), the problems of utilisation of digital information resources arise basically from information pollution and overload, destabilization potential, information insecurity, socio-technical issues and potential lack of control over communication. He further states that information pollution arises from dysfunctional provision of information that is caused

by: (a) the amount of digital information resources available that exceeds the capacity of recipient to examine, to filter, and to assimilate relevant information, and (b) provision of wrong information resulting in incorrect decisions. Bassy, (2020) states that the proliferation of digital sources for articles and the sheer amount of digital information now available may be confusing to some users, since retrieving too much digital information is a problem, as users may get lost and may not know when to quit searching. In the course of using digital information resources and services in the library for research activities by postgraduate students, library users face some challenges. These challenges make it difficult for them to access and use information resources and services through the digital library services of the libraries anytime, anywhere, which will lead to meeting the ever-growing and dynamic information needs of users.

Digital library services offer numerous advantages, but users still face challenges. These include poor information technology infrastructure development, lack of knowledge on e-journal usage, facilities, time, and awareness, large mass of irrelevant information, filtering results, download delays, failure to find information, inadequate search skills, high costs of access, inaccessibility of digital information resources, difficulties in navigating through digital resources, lack of awareness, inadequate computer systems, slow internet speed, poor network service, frequent power failure, poor internet connectivity, improper guidance on electronic resource use, non-payment of subscriptions, lack of personal computers, and slow downloading and blockage of websites. Academic libraries in Nigeria are particularly challenged to upgrade their systems in this era of digitization. Problems of utilisation of digital information resources arise from information pollution, overload, destabilization potential, information insecurity, socio-technical issues, and potential lack of control over communication.

From the studies above have investigated students challenges on the use of digital library services, Digital library services offer numerous advantages, but users still face challenges. These include poor information technology infrastructure development, lack of knowledge on e-journal usage, facilities, time, and awareness, large mass of irrelevant information, filtering results, download delays, failure to find information, inadequate search skills, high costs of access, inaccessibility of digital information resources, difficulties in navigating through digital resources, lack of awareness, insufficient bandwidth, high cost of internet connectivity, inadequate computer systems, slow internet speed, poor network service, frequent power failure, poor internet connectivity, improper guidance on electronic resource use, non-payment of subscriptions, lack of personal computers, and slow downloading and blockage of websites. Academic libraries in Nigeria are particularly challenged to upgrade their systems in this era of digitization. The problems of utilisation of digital information resources arise from information pollution, overload, destabilization potential, information insecurity, socio-technical issues, and potential lack of control over communication. Academic librarians can provide a lasting solution by supporting lecturers and researchers, providing adequate and timely information resources, and providing a conducive platform for maximum utilisation.

These challenges include:

1. Slow Speed of the Internet Connectivity
2. Unsteady Power Supply
3. Information Security for the virus
4. Sustainable Funding
5. High Cost of Infrastructure
6. Building Digital Collections

7. Insufficient Digital Local Content

8. Lack of Digital literacy

9. Copyright Challenges

10. Equity of Access

11. Digital

Preservation

Postgraduate students at Kashim Ibrahim Library (KIL), Ahmadu Bello University (ABU), Zaria, face several challenges when utilising digital library resources. Some of the common issues include:

Slow Speed of Internet Connectivity

Poor internet speeds and unreliable connections can significantly affect the ability to access and download digital materials. It will difficult to have a smooth and speedy internet service (Otobule and Akintola 2019) further stated that, The vast majority of the Nigerian universities are as yet sitting tight for full Wi-Fi empower grounds. A portion of the universities are giving availability in the libraries, hostels and offices just which it's sufficient to offer versatile types of assistance into the premises still it is possible to expect to ride portal web while progressing. Nigeria universities struggle with fast internet service, with many lacking full Wi-Fi access. Some offer limited facilities in libraries, hostels and offices, but portable internet is expected as progress continues.

Unsteady Power Supply

Electricity supply from the national grid in Nigeria is unpredictable. These often disrupt the use of digital library services in libraries. Unpredictable electricity supply from Nigeria's national grid can disrupt the use of digital library services in libraries.

Information Security for the virus

Digital library as an Internet based system is faced with the problems of information insecurity. Internet-based systems are characterized by “openness, dynamism, connectivity and hostility” (jacobsson, 2019). Virus attacks are a common occurrence in digital libraries. Most licensed antivirus is expensive and most libraries cannot afford them while free antivirus are not powerful enough to guard digital library system effectively. Virtual libraries require advanced technological infrastructure like telecommunication, servers, and software applications to make global information resources accessible, but extensive computerization and digitization can limit their operation.

Sustainable Funding

Libraries in developing countries are seeking an alternative means of funding to meet up with technological advancements. According to Ogundipe (2020), the National Universities Commission has recommended that 10% of the universities recurrent budget be allotted to the Library but this is hardly complied with because poor funding has been noted as the major hindrance to digital libraries in developing countries. This is because funds allotted to Libraries have a major influence in the provision of qualitative and quantitative information materials. Ahmed and Nwalo (2020). Swayaden (2013) states that fundraising must become an integral part of libraries budget and a close cooperation between local, national and international libraries must be encouraged. A study by Rosenberg and Raseraka (2018) showed that financing of institutions in Africa is still lower than developed countries, with international countries financing at six percent of budget while Africa still finances at four percent. Adekunle (2020) suggests that grants-in-aids and donations plays a vital role in supporting Libraries and there is a need for Librarians to be trained on grant proposal writing. Libraries in Africa are heavily dependent on the national governments for most of their budgets. University of Zimbabwe and

University of Zambia suffered from budget cuts and were heavily dependent on gifts and donations in 2002. Also in 2005 University of Botswana suffered from budget cuts. It has become obvious that the challenge of budget cuts is recurrent in dwindling economies, also digital libraries are dependent on their parent organization, and inadequacy of funding is therefore linked to a depressed economy (Ofoegbu and Alonge, 2019). Emphasis has continually been made on decreased funding in developing countries, since digital libraries exists within the parent organization, consequently funding is dependent on the amount given by the institution.

High Cost of Infrastructure

In developing countries, a clear digital divide exists in the access to information communication technology. These challenges include inadequate network infrastructures, bandwidth issues among others. Aluoch (2019), states that internet connectivity in Africa is still very poor,unreliable and very expensive. It has been noted from the African Tertiary Institution Connectivity survey that universities in Africa much higher fees for internet connectivity than the developed world. The high cost of internet connectivity has been in relation to the limited availability and capacity on the national fibre backbone Reliability and fast internet connection is required to access scholarly publications in the world. Ugwanyi (2020) observed that bandwidth allocation is too expensive and this makes it difficult to access academic resources in Nigeria. The findings from a survey by Ugwanyi and Enhenzona (2020) showed that African University have low speed internet connection and the challenges with power supply in Africa has grossly endangered internet connectivity, and further noted that slow bandwidth is the main limitation to assessing digital libraries in developing countries .Omekwu and Echezona (2019) noted that the North South divide is skewed against Africa making access to information faster and diverse in developed countries than developing countries .In order to improve information access in spite of

these challenges. Developing countries are encouraged to bridge this gap in the divide to ensure information and research exchange (Adekunle, Omaba and Tella, 2020). Also Information Technology policy makers must intensify effort in bridging this divide.

Building Digital Collections

Developing countries should be empowered to produce digital collects not just being majorly consumers. In the developed world huge investments have been made in the establishment of digital libraries. For instance the Library of Congress made a initial investment of sixty million dollars in the development of the American National Digital Library. Though building digital libraries is financially demanding. Developing countries can take advantage of partnerships and subscribe to open access software’s as tools in building their digital collections. Also developing countries should subscribe to open access initiatives. Nwagwu (2016) noted that only three universities in Nigeria had subscribed to open access digital libraries. Adebayo et al. (2018) highlighted challenges in digitizing to include increased expenditure, staffing issues and preservation challenges as major challenges encountered when building digital libraries in developing countries. African countries can take advantage of institutional repositories in the digitization of African content on the web. Proffering solutions to the challenge of insufficient funding there is a need for African countries to collaborate with institutions in their region to proffer solutions to these challenges.

Insufficient Digital Local Content

Local content in developing countries is still relatively low and this invariably affects digital libraries. In Africa, it has been noted that Africa produced content accounts for less than 0.05 percent of the global content. Factors affecting the dearth of digital content include the high cost of building digital content, inappropriate training of content creators an being abreast with

the latest technologies in content creation (Igun, 2019). Nwagwu (2020) noted that there is limited availability of information and knowledge systems that address African needs. Though local content is readily available in developing countries, these countries are still plagued with the challenge of capturing, repackaging and disseminating this information. Most local contents in African countries are still in their traditional form and there is need for African countries to make these contents more accessible by taking advantage of digital libraries and the latest advancements in computer applications development. Nwagwu (2020) further, stated that factors such as poor policies, lack of electricity, low technology penetration, lack of content development, poor reading habits and brain drain still limited content development in Africa. In 2003, it was noted that 900,000 books are estimated to be published every year in the world of which only 1.5percent is published in Africa (Ogundipe, 2020). A large amount of indigenous knowledge is currently available in African countries and there is a need for developing countries to wake up to this challenge and increase the local content available. Developing countries should focus more on building standard databases with local content. In Africa currently an organization named African Journal Online provides access to African research, though AJOL is not open access. This is a welcome development to organizations in developing countries to focus on building digital libraries with local content.

Lack of Digital literacy

The information age demands the ability to identify, organize, understand and create information. Based on the enormous information available on the web, adequate skill is required. Several studies have shown that a lack of digital literacy is responsible for the underutilisation of digital libraries. There is therefore a need for information literacy skill to be taught to all categories of users as general internet searches compete greatly with these resources. It is

important for users to be taught the value of authoritative information. Digital libraries deliver library caliber knowledge and these enable users to be free from unauthoritative information. Ekere, Omekwu and Nwoha (2022). Library professionals should continue to intensify efforts on user education. Also as suggested by Igun (2019), 21st century librarians should be trained on the relevant ICT skills. This is paramount because the capacity of use and access to digital libraries by users depends largely on literacy and mastery of these emerging technologies Ugwuanyi (2020).

Copyright

Challenges

Digital Libraries recognizes the protection of legal rights such as copyright, intellectual property rights, privacy among others. A copyright is the legal exclusive right granted by owners of an intellectual property for economic reasons. However, there are legal issues that make management difficult in digital libraries. An example of this is the impact of the social media on digital libraries. Academic social media websites request researchers to deposit their research output, without proper understanding of these laws; this could pose a great challenge in digital libraries. Also in the building of institutional repositories copyright laws must also be considered before research outputs are uploaded. Other Legal issues include issues defining the use of intellectual property and how fair use applies to intellectual property. Managing intellectual property is one of the greatest challenges facing digital libraries in developing countries. Digital Librarian must protect digital content from unauthorized access, copying and inappropriate use.

Equity

of

Access

One of the challenges still facing digital libraries in developing countries is equity of access. Despite of movements on open access initiatives in developing countries, researchers still find it difficult to access scholarly publications in digital libraries .Researchers are still required

to pay a processing fee to access articles. Universities in developing countries periodically subscribe to electronic resources but researchers are still required to pay for access to some scholarly articles especially in sciences. This causes a digital divide making a clear gap between the developed and developing countries in research and development. Most countries in developing countries do not have an open access policy that guides the sharing of resources in their digital libraries. Only few institutions in Nigeria have open access institutional repositories. There is a need to promote effective access by making digital library collections easily accessible for use.

Digital

Preservation

Digital preservation is the planning and application of preservation methods to ensure that digital content remains accessible and usable in the long-term. Preservation of digital materials has been in the fore-front of research in the recent time. The preservation of digital resources aims at making local content accessible at a later time. Also digital preservation as managed activities for the long-term maintenance of a document and for continued accessibility in spite of changing technologies. Digital Libraries are still faced with numerous challenges in the preservation of digital content which includes inadequate funding, insufficient institutional support, lack of support from stakeholders and no clear policy on the preservation of digital content. In developing countries preservation policies must be established to enable libraries preserve digital collections effectively. Challenges in the preservation include the nature of digital materials, dependence on hardware and software technologies which are fragile and also the short life span of digital media, formats, and styles in digital preservation among others. In the preservation of digital libraries, library professionals should take advantage of advanced technologies and ensure that clear policies are put in place for seamless operations in the future.

2.10 Review of Empirical Studies

The study by Vijayakumar (2016) aimed to identify views on digital libraries among LIS professionals in Tamil Nadu and their satisfaction with their use. Hypotheses were formulated, including differing opinions on website appearance, flexibility, usability, and effectiveness in task completion on digital library services. This study is related to the present study in the area of methodology, and the sample size of my study. Also, Komolafe-Opadeji's 2019 study found that Nigerian postgraduate students regularly access the internet and prefer free online resources like Google and Wikipedia over subscription databases like HINARI, EBSCOHOST, JSTORE, QUESTIA, and HIGH BEAM. The University of Calabar Library has access to various databases, but some, like Ebscohost, AGORA, Nexis Lexis, Dialog Database, ACM, ARDI, and Datastar Database, are unavailable due to expired subscriptions. This study is related to the present study in the area of methodology, population and sample size of my study. On other hand, the study by Ebijuwa (2019) explores the relationship between social media use and electronic resources usage by undergraduates in federal universities in Southwest Nigeria. The research reveals that students use electronic resources for academic purposes such as updating knowledge, class assignments, scholarship opportunities, research, and blogging. Challenges faced by students include difficulty accessing resources, website problems, poor internet, and access to databases. However, no significant difference was found between Science and Art students in the University of Abuja Library. However, the study evaluates the acquisition of e-resources in Karnataka state university libraries, focusing on internet facilities, CD-ROM repositories, online services, and consortium activities. Challenges include inadequate internet sites, low frequency, limited CDROM library acquisition, and limited scholarly article selection. Moreover, Hossaini's study on electronic resources in two academic libraries revealed a growing

trend of e-resources over conventional books. The research used primary and secondary data collection, focusing on the impact on users and highlighting pros and cons of e-resource usage. This study is related to the present study in the area of methodology, population and sample size of my study. and lastly, Ananda's study on electronic information resources awareness among UG and PG students at John College revealed 81% of students are aware, with project research being the primary use.

2.11 Summary of the Review

The study investigate the utilisation of digital library services for research activities by postgraduate students in Kashim Ibrahim Library Ahmadu Bello University, Zaria. The findings showed that:

Postgraduate students extensively use digital library services for research purposes. The most frequently used digital resources are digital journal, digital thesis and dissertations, and online public access catalogue. Students face challenges such as poor internet connectivity, unsteady power supply and limited access to relevant digital resources. The library needs to improve its digital infrastructure, providing training and support, and expand its digital collections to meet the research needs of postgraduate students.

Overall, the study highlights the importance of digital library services for postgraduate research and need for libraries to address the challenges faced by users to enhance their research experience. This study contributes to the existing body of knowledge on digital library services by providing insights into the utilisation of digital library services for research activities by postgraduate students in Kashim Ibrahim Library, Ahmadu Bello University Zaria.

1. High usage of digital library services for research purposes, highlighting the importance of digital resources for postgraduate research.

2. Gaps in training and support for using digital library services, indicating a need for library-led initiatives to enhance digital literacy.
3. Challenges with internet connectivity and access to relevant digital resources, underscoring the need for infrastructure upgrades and collection development.
4. Significant correlations between frequency of digital library service use and research productivity, suggesting that digital library services can positively impact research outcomes.

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CHAPTER THREE RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the research procedures that was adopted to carry out the study.

The outline of the chapter is listed below:-

3.2 Research Methodology Adapted for the Study

3.2.1 Research Design Adopted for the Study

3.3 Population of the Study

3.4 Sample Size and Sampling Technique

3.5 Instruments for Data Collection

3.6 Validation of the Instrument

3.7 Reliability of the Instrument

3.8 Procedure for Data Collection

3.9 Procedure for Data Analysis

3.2 Research Methodology Adopted for the Study

This study used quantitative research methodology because it contained a systematic empirical of social observable phenomena through statistical mathematics or computational technique. According to Wyse (2019) quantitative research methodology is used to quantify attitude, opinions, behaviors, and other defined variables and generalize results from a large sample population. Kombo (2019) stated that, the reason why researchers used quantitative

method is because it is used to quantify the problem by way of generating numerical data. In a similar word, Hayes (2019) described quantitative methodology as a method which enables description of a population in a measurable data such as numbers to represent them. More so, Osuala (2020) gave his input that, quantitative methodology allows the researcher to collect responses, analyze and interpret the data for the entire study to be generalized from the sample to represent the population.

3.2.1 Research Design Adopted for the Study

The research design adopted for this study was cross sectional survey design. Cross-sectional survey is a method that involves the analysis of data collected from a population, or a representative subset, at one specific point in time. According to McMillan and Schumacher, (2021) stated that cross sectional survey research design is a study concerned with obtaining information by administering the questionnaire to a sample of the population which serves as the respondents.

3.3 Population of the Study

The population of this study comprised of regular postgraduate students in Ahmadu Bello University, Zaria who were registered in 2021/2022 academic session. According to School of Postgraduate Studies, ABU, Zaria. (2022), There are Two Thousand Eight Hundred (2,800) registered PG students for 2021/2022 academic session as at 2nd February 2022. Table 3.1 presents the breakdown of the population of this study according to the various faculties;

Table 3.1 Registered PG Students of Ahmadu Bello University, Zaria based on Faculties

S/N	Faculties	Number of Registered Students
1	Arts	176
2	Administration	167
3	Agriculture	118
4	Clinical Sciences	30
5	Education	711
6	Engineering	313
7	Environmental Design	317
8	Law	77
9	Life Sciences	207
10	Physical Sciences	316
11	Pharmaceutical Sciences	99
12	Social Sciences	198
13	Veterinary Medicine	71
14	Total	2,800

Source: List of Registered PG Students as Obtained from the PG School of Ahmadu Bello University, Zaria (02/02/2022).

3.4 Sample Size and Sampling Technique

The sample size of this study comprised of Three hundred and thirty-eight (338) postgraduate students at ABU, Zaria. The researcher was able to determine the size by using Krejcie and Morgan's sample size table from 1970. The Krejcie and Morgan sample size Table of 1970 indicated that if the population of the study is between 2,800 and 2,999, then the sample size should be 338. The Table is attached as Appendix (III) on page 96.

The sampling technique for the study is proportionate stratified sampling. A proportionate sample means that the size of the sample number is proportional to the size of the population. In other words, the probability of a unit being selected from the stratum is proportional to the relative size of that simple random sample in the population Cherry (2019).

The selection was done through percentages of the population and that of sample which give the 338.

Table 3.2 Sample Size of the Study

S/N	Faculties	Number of Registered Students	Samples number of postgraduate students
1	Arts	176	24
2	Administration	167	20
3	Agriculture	118	14
4	Clinical Sciences	99	12
5	Education	711	86
6	Engineering	313	37
7	Environmental Design	317	38
8	Law	77	9
9	Life Sciences	207	25
10	Physical Sciences	316	38
11	Pharmaceutical Sciences	30	4
12	Social Sciences	198	24
13	Veterinary Medicine	71	7
	Total	2,800	338

3.5 Instrument for Data Collection

Questionnaire was used as the instrument for data collection for this research. Considering its significance, Osuala (2020) posited that a questionnaire is more economical because of the time involved in conducting research. Also, the questionnaire's ability to elicit quantitative data on observably behaviors such as feelings, attitudes, ideas, opinions, and viewpoints made it an instrument of choice. The questionnaire is divided into six (6) sections. Sections 'A' of the questionnaire consist of demographic information of the respondents. Section 'B' consist of type of digital library services in KIL, ABU, Zaria. Section 'C' consists the procedure through which to access digital library services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria.

Section ‘D’ consists of research activities carried with digital library services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria. Section ‘E’ consists of the extent of utilising digital library services for access to information and services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria. Section ‘F’ consists challenges that user’s encounter in utilising digital library services for access to information and services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria.

3.5.1 Validity of the Instrument

The number experts who validate the instrument were six (6) experts in number that made the validation of the instruments, two (2) experts from statistician, two (2) experts from language and lastly two (2) experts are my supervisory team that makes validation of the instrument. However, in order to ascertain the validity of the instrument, the researcher subjected it to research instrument to experts are in statistician, language and the supervisory team for validation. The instrument was corrected, and the comments of the supervisors were used to improve the item's structure and format. The instrument was further subjected to both face and content validation. The decision by the researcher to adopt face and content validity was based on the remark by Ibrahim (2013) that validation by expert is an effective method of measuring the accuracy of the instrument and determining the adequacy of coverage of a topic.

3.5.2 Reliability of the Instrument

Reliability of an instrument deals with the measurement of internal consistency of an instrument if administered on similar respondents more than once. Similarly, The Pilot study for the purpose of this research was conducted in Umaru Musa Yar adu University, Katsina, the reason for taken this university, because it is not part of the study area and but it has similar characteristics with my study area, Split-half technique was used to determine the reliability of

the instrument. The scores were corrected to get the reliability co-efficient alpha where 0.81 was obtained this shows that the instrument is reliable since the co-efficient is above 0.5. in appendix IV, page 96.

3.6 Procedure for Data Collection

The researcher collected an introductory letter from the Head of Department of Library and Information Science, Ahmadu Bello University Zaria to allow the researcher gain access to postgraduate students in Ahmadu Bello University, Zaria. The researcher with the help of two research assistants administered the questionnaire and collected the completed ones from the respondents. Three (3) weeks was used to administer and retrieve the questionnaire from the respondents in lecture halls, e-library at Kashim Ibrahim Library, and also at their various departmental and faculties in Ahmadu Bello University, Zaria.

3.7 Method of Data Analysis

Descriptive statistics in the form of frequency count, simple percentage, mean, and standard deviation were used to analyze the data relating to the research questions raised for this study. Fifty percent (50%) response and a 2.50 mean score were used as benchmarks for decision-making and anything less than them is considered negative.

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CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presented the data collected for the study. The data was analyzed and discussed in relation to the research questions raised and the findings were presented as below.

4.2 Response Rate

Three hundred and thirty-eight (338) copies of the questionnaire were distributed to the respondents and two hundred and ninety-six 296 (91.9%) copies were returned and found valid for analysis and discussion. The response rate is presented in Table 4.1

Table 4.1: Response Rate

S/N	Faculties	Copies of Questionnaire Distributed	Copies of Questionnaire Returned	Response Rate (%)
1.	Arts	14	12	4.0
2.	Administration	24	23	7.7
3.	Agriculture	20	18	6.0
4.	Clinical Sciences	28	25	8.4
5.	Education	86	60	20.2
6.	Engineering	38	36	12.1
7.	Environmental Design	38	35	11.8
8.	Law	9	7	2.3
9.	Life Sciences	25	22	7.4
10.	Physical Sciences	12	10	3.3
11.	Pharmaceutical Sciences	4	3	1.0
12.	Social Sciences	24	20	6.7
13.	Veterinary Medicine	7	3	1.0
Total		338	296	91.9%

Figure 4.1. Distributed and retrieved copies of Questionnaire to Respondents

Table 4.1 indicate that a total of 338 copies of questionnaire were administered to the respondents and 296 (91.9%) made it back successfully, which implied that less than (8.1%) copies were un-retrievable due to the fact that some of the respondents could not be traced and some misplaced their copies. As a result, the researcher based his further analysis on 296 copies that were successfully returned.

4.3 Data Analysis and Discussion

The data collected for the study in this section were analyzed and discussed using frequency count table, mean and standard deviation.

4.3.1: Types of Digital Library Services Accessed by Postgraduate Students in KIL, ABU, Zaria

This section attempted to find out the types of digital library services accessed by postgraduate students in Kashim Ibrahim Library. To achieve this objective respondents were asked to indicate the options that best suit their opinion.

Table 4.2: Types of digital library services

S/N	Types of digital library services	Freq	%	Mean \bar{x}
1	Online Public Access Catalogue Service	54	18.2	2.27
2	Digital Theses and Dissertation Service	56	18.9	2.36
3	Digital Cataloging and Classification Service	42	14.18	1.77
4	Digital Journal Service	41	13.85	1.73
5	Digital Reference Service	34	11.48	1.43
6	Digital Books Service	26	8.78	1.0

7	Digital Selective Dissemination of Information Service	24	8.10	1.01
8	Digital Document Delivery Service	19	6.41	0.80

Source: field survey 2023

Key: \bar{x} =mean, %= Percentage, Freq= Frequency

Table 4.2 shows the types of Digital Library Services that Postgraduate Students use for Research activities in Kashim Ibrahim Library, Ahmadu Bello University, Zaria and the Table revealed that Digital Theses and Dissertation Service mean has the percentage 18.9% and a mean \bar{x} = 2.36, followed by Online Public Access Catalogue Service 18.2% and a \bar{x} = 2.27, followed by Digital Cataloguing and Classification Service 14.18% and a \bar{x} = 1.77, followed by Digital Journal Service 13.85% and a 1.73, followed by Digital Reference Service 11.48 % and a \bar{x} = 1.43, followed by Digital Books Service 8.78% , and a \bar{x} = 1.0, followed by Digital Selective Dissemination of Information Service 8.10% and a \bar{x} = 1.01, and followed by Digital Document Delivery Service 6.41 % and of a \bar{x} = 0.80, However, a further observation from Table 4.2 indicated that Digital Document Delivery Service, Digital Selective Dissemination of Information Service, and Digital Books Service, were minimally utilised due to the fact that majority of the postgraduate students are relying on Digital Theses and Dissertation Service, Online Public Access Catalogue Service, Digital Cataloguing and Classification Service, Digital Journal Service, and Digital Reference Service.

This study corroborates earlier with the findings of Weber and Flatley (2019) stated in their study that most students go to the Internet first when doing research. According to them, this is not a bad thing instead it is an opportunity to continually market and offer the library's services and resources through channels that are familiar to students. According to Agaba (2020)

the shift from printed forms of information resources to electronic information materials should lead to better quality and efficient and effective research if used by academic staff and students.

4.3.2 Access to Digital Library Services by Postgraduate Students

This subsection focus on means followed in getting access to digital library services. The essence of this question is to find out how Postgraduate Students have access to digital library services through <https://library.abu.edu.ng> in Kashim Ibrahim Library, Ahmadu Bello University, Zaria. Table 4.3: shows how digital library services are accessed.

Table 4.3: Accessibility of Digital Library Services

S/N	Access to Digital Library Services by Postgraduate Students	Freq	%	Mean = \bar{x}
1	Through Digital Repositories	110	37.1	9.2
2	Through Subscribed Databases	96	32.4	8.1
3	Through Open Access Databases	55	18.5	3.7
4	Through Free E-books Areas	35	11.8	2.9

Key: \bar{x} = mean, %= Percentage, Freq= Frequency

The findings in Table 4.3 shows that Digital Repositories has the highest percentage 37.1% and a \bar{x} = 9.2, this was followed by Subscribed Databases with a percentage of 32.4% and a \bar{x} = 8.1, followed by Open Access Databases with the percentage of 18.5% and a \bar{x} = 3.5, followed by Free E-books Area with a percentage of 11.8% and a \bar{x} = 2.9, However, a further

observation from the above Table 4.6.1 indicated that Free e-books Area, were minimally utilised due to the fact that majority of the postgraduate students are relying on Digital Repositories,Subscribed Databases and Open Access Databases.

This finding is supported with the findings of Komolafe-Opadeji (2019) who indicated that postgraduate students regularly access the Internet and preferred the use of free online resources from Google and Wikipedia to subscribe online databases like HINARI,EBSCOHOST, JSTORE, QUESTIA and HIGH BEAM. On-site visit to the library record revealed that, the library had access to the following databases: Ebscohost, Science Direct, TEEAL, OARE, ACM, OAPEN, OAJSE, AJOL, SAGEOPEN,, SAPINGER Open and ARDI. The University of Calabar Library website had access link to HINARI, AGORA, EBSCOHOST, TEAL, Nigerian Virtual Library and Science Direct. However, as at the time of the visit, the library had access only to Science Direct, Nigerian Virtual Library, HINARI, OARE, OAPEN, OAJSE, AJOL, SAGEOPEN, Springer Open and TEEAL. Others (i.e. Ebscohost, AGORA, Nexis Lexis, Dialog Database, ACM, ARDI and Data star Database) could not be accessed because their subscription had expired.

4.3.3: Research Activities performed by Postgraduate Students

This subsection focus on research activities. The essence of this question is to find out how Postgraduate Students have utilized digital library services research activities in Kashim Ibrahim Library, Ahmadu Bello University,Zaria.

Table 4.4: Research Activities performed by Postgraduate Students with Utilisation of Digital Library Services

S/N	Research Activities performed by Postgraduate Students	Frequency	%	Mean= \bar{x}
1	Identification of area of interest	123	41.5	5.9
2	Conducting related literature	111	37.5	5.3
3	Coining of topic/title	105	35.4	5.0
4	Choosing methodology	103	34.9	4.9
5	Conducting analysis and interpretation	100	33.8	4.8
6	Problem Identification	97	32.7	4.6
7	Extracting journals and articles/conferences	67	22.63	3.2

The finding in the Table 4.4 shows that identification of area of interest with the highest percentage 41.5%, and a $\bar{x} = 5.9$, this was followed by suiting related literature 37.5% and a $\bar{x} = 5.3$, this was followed by coining of topic/title 35.4%, and a $\bar{x} = 5.0$, this was followed by choosing methodology 34.9%, and a $\bar{x} = 4.9$, this was followed by conducting analysis and interpretation 33.8%, and a $\bar{x} = 4.8$, this was followed by problem identification with the percentage of 32.7%, and a $\bar{x} = 4.6$, and this was followed by extracting journals articles/conferences 22.6%, and a $\bar{x} = 3.2$. However, a further observation from the Table 4.5 indicated that Extracting journals articles/conferences, coining of topic/title, and conducting analysis and interpretation were minimally utilised due to the fact that majority of the postgraduate students are relying on identification of area of interest, suiting related literature, problem identification, and choosing methodology.

This finding is supported with Ebijuwa (2019) whose study revealed that in academic activities the undergraduate students used electronic library resources more. The academic purposes are to update student knowledge in their subject areas of interest, class assignment, scholarship opportunities, research/writing project, retrieve current literature for studies to follow, blog discussion on subject area of interest and using Internet in accessing the library chat with friends.

4.3.4 Extent of Satisfaction with Digital Library Services by Postgraduate Students in Ahmadu Bello University, Zaria

Information on extent of satisfaction with the digital library services by postgraduate students was sought. To achieve this objective, respondents were asked to indicate the options that best suit their opinions.

Table4.5: Extent of satisfaction when utilising digital library services

S/N	Statements	Highly Satisfied (HS)		Satisfied (S)		Rarely satisfied (RS)		Not satisfied (NT)		λ	Mean \bar{x}	SD
		Freq	%	Freq	%	Freq	%	Freq	%			
	I am satisfied when using:											
1	digital theses and dissertation service (DTDS)	23	7.77	13	4.39	6	2.03	5	1.68	47	4.70	0.52
2	digital cataloguing and classification service (DCCS)	22	7.43	8	2.70	8	2.70	3	1.01	41	4.50	0.50
3	digital journals service (DJS)	31	10.5	18	6.08	7	2.36	6	2.02	62	6.80	0.75
4	digital selective dissemination of information service (DSDIS)	12	4.0	7	2.36	1	0.33	3	1.01	23	2.50	0.27
5	digital reference service (DRS)	15	5.0	8	2.70	2	0.67	1	0.33	26	2.80	0.31
6	online public access catalog service (OPACS)	19	6.4	14	4.72	7	2.36	2	0.67	42	4.60	0.51
7	digital books service (DBS)	9	3.0	10	3.37	3	1.01	1	0.33	23	2.50	0.27
8	digital document delivery service (DDDS)	6	2.0	8	2.70	2	0.67	1	0.33	17	1.10	0.12

Table 4.5 Shows the extent of respondent's satisfaction with digital library services that postgraduate students use for research activities in Kashim Ibrahim Library, Ahmadu Bello University when accessing digital library services. The table revealed digital journals service, had the $\bar{x} = 6.80\%$, $SD = 0.70$, followed by Digital Theses and Dissertation Service with the $\bar{x} = 4.70\%$, $SD = 0.52$, Online Public Access Catalog Service $\bar{x} = 4.60\%$, $SD = 0.60$, followed by Cataloguing and Classification Service $\bar{x} = 4.50\%$, $SD = 0.50$, followed by Digital Reference Service $\bar{x} = 2.80\%$, $SD = 0.31$, followed by Digital Books Service $\bar{x} = 2.50\%$, $SD = 0.27$, and Digital Selective Dissemination of Information Service $\bar{x} = 2.50\%$, $SD = 0.27$, followed by Digital Document Delivery Service $\bar{x} = 1.10\%$, $SD = 0.12$. It can be deduced that Digital Journal Service is the mostly utilised by Postgraduate Students. While the least utilised is Digital Document Delivery Service by Postgraduate Students in Kashim Ibrahim Library, Ahmadu Bello University, Zaria. In line with these main benefits of digital journals service is their accessibility. Readers can access digital information resources from anywhere with an internet connection, meaning that they are not limited by geographical location.

However, a further observation from the table indicated that Digital Document Delivery Service, Digital Selective Dissemination of Information Service Digital Selective, Digital Books Service, and Digital Reference Service were minimally utilised due to the fact that majority of postgraduate students are relying on Digital Journals Service, Digital Theses and Dissertation Service, Digital Cataloguing and Classification Service, and Online Public Access Catalog Service.

This finding is supported with the result of Urhiewhu and Emojorho (2021) who revealed low extent of usage of digital resources by undergraduates of University of Benin, Ambrose Alli University, Delta State University and Federal University of Petroleum Resources Effinrum. On the use of electronic resources for academic activities by undergraduate (Science and Arts) students, this study revealed moderate use of electronic resources in the University of Abuja Library for academic activities such as preparation of lecture note, downloading articles for project work, supporting course materials, keeping the students updated in their field of study and for writing assignment.

4.3.5: Challenges Faced by Postgraduate Students while Utilising of Digital Library services for Research Activities

It was part of the objective of the study to find out the challenges faced by postgraduate students while utilising digital library services for research activities. To achieve this objective, the respondents were asked to indicate the challenges they face. Table 4.6 presents the findings.

Table 4.6: Challenges faced while Utilising Digital Library Services

S/N0	Challenges faced while Utilising Digital Library Services	Frequency	%	Mean \bar{x}
1	High cost of infrastructure	45	7.1	0.65
2	Lack of digital literacy	50	7.9	0.72
3	Copy right challenges	85	13.5	1.23
4	Equity of access	40	6.3	0.57
5	Digital preservation	90	14.3	1.30
6	Information security for the virus	44	7.0	0.63
7	Sustainable funding	42	6.6	0.60
8	Unsteady power supply	100	15.9	1.44
9	Slow speed of internet connectivity	111	17.6	1.60
10	Insufficient digital local content	11	1.7	0.15
11	Building digital collections	10	1.5	0.14

The result in Table 4.6 shows that in using digital library services are a lot of challenges are face by the respondents such as :slow speed of internet connectivity had the highest percentage of 17.6%, and a $\bar{x} = 1.60$, followed by unsteady power supply with the percentage of 15.9%, and a $\bar{x} = 1.44$, followed by digital preservation with the percentage of 14.3%, and a $\bar{x} = 1.30$, follow by copy right challenges of 13.5%, and a $\bar{x} = 1.23$, follow by lack of digital literacy of 7.9%, and a $\bar{x} = 0.72$, follow by high cost of infrastructure of 7.1%, and a $\bar{x} = 0.65$, follow by information security for the virus of 7.0%, and a $\bar{x} = 0.63$, follow by sustainable funding of 6.6%, and a $\bar{x} = 0.60$, follow by equity of access of 6.3%, and a $\bar{x} = 0.59$, follow by insufficient digital local content of 1.7%, and a $\bar{x} = 0.15$, follow by building digital collections of 1.5, and a $\bar{x} = 0.14$.

This finding corroborates with the result of this study with the finding of On challenges encountered by the undergraduate (Sciences and Arts) in the use of electronic resources in the University of Abuja Library, Abubakar (2019). The study revealed high challenges such as difficulty in accessing electronic resources from within the library and outside the library, website problem and poor internet. Other challenges accessed to be moderate are access to databases, inadequate ICT infrastructure and others. This finding agreed with Omosokejimi, Eghworo and Ogo (2019), Omehizor, Akibu and Akinwoye (2019) and Sohail and Ahmad (2020) who respectively identified poor ICT infrastructure development, slow downloading and blockage website, large mass of irrelevant information, inadequate search skills, high cost of access, in accessibility of some electronic resources and difficulties in navigating through electronic resources and so on to be among the numerous challenges encountered by students in the use of electronic resources.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter consists of the summary of the study, summary of the findings, conclusion and recommendations.

5.2 Summary of the Study

The study was conducted to find out the utilisation of digital library services of postgraduate students in Kashim Ibrahim Library, Ahmadu Bello University, Zaria. Chapter one introduced the background to the study, statement of the problem, research questions and objectives of the study, significant of the study, scope of the study , and the operational definition of terms.

In chapter two, an attempt was made to review relevant and related literature on concept digital library services, types of digital library services, access to digital library services for research activities performed by postgraduate students, extent of satisfaction with digital library service by postgraduate students, challenged faced with digital library by postgraduate students, review of empirical studies, previous research works, papers presented at the seminars were reviewed in the chapter.

Chapter three comprised the research methodology, research design used, population of the study, sample size and sampling techniques, validity of the instrument, research instrument, procedure for data collection, and procedure for data analysis.

Chapter four contained data presentation, analysis, and discussion of the findings. The findings of the study, were based on the analysis of the questionnaire obtained. The chapter employed statistical tools such as frequency distribution, percentages, mean, and standard deviation.

5.3 Summary of the Findings

The following findings were revealed in accordance with the research questions raised for the study:

1. The types of digital library services accessed by postgraduate students are: Digital Journal Service, Digital Theses and Dissertation Service, and Online Public Access Catalog Service, Digital Cataloguing and Classification Service; Digital Reference Service and Digital Selective Dissemination of Information Services.
2. Postgraduate students means of accessing digital library services is through digital repositories, subscribed database, open access databases, and free e-books areas.
3. The research activities that postgraduate students at Ahmadu Bello University Zaria used for digital library service is the identification of areas of interest, extracting journals articles/conferences, conducting analysis and interpretation, choosing methodology, identification of area of interest, problem identification, coining of topic/title, consulting related literature.
4. The postgraduate students of Ahmadu Bello University Zaria were highly satisfied with Digital Journal Service, Digital Theses and Dissertation Service, Online Public Access Catalogue Service and Digital Cataloguing and Classification Service.
5. The challenges faced by postgraduate students in utilising digital library services for research activities were slow speed of Internet, unsteady power supply among others.

5.4 Contribution to Knowledge

This study contributes to the existing body of knowledge on digital library services by providing insights into the utilisation of digital library services for research activities by postgraduate students in Kashim Ibrahim Library, Ahmadu Bello University Zaria.

1. High usage of digital library services for research purposes, highlighting the importance of digital resources for postgraduate research.
2. Gaps in training and support for using digital library services, indicating a need for library-led initiatives to enhance digital literacy.

5.3 Limitations of the Study

This study is limited by the sampled number of respondents covered because it is not open to other categories of students. The study was faced with difficulties in reaching some of the postgraduate students. This led to the disappearance of many copies of the questionnaire. A lot of time was also spent retrieving the missed questionnaire.

5.6 Conclusion

The utilise of digital library services at Ahmadu Bello University, Zaria's Kashim Ibrahim Library considerably improves postgraduate students' research endeavors, according to the study's conclusions. These services give users access to a wide range of electronic resources, such as e-journals service, e- theses and dissertations service, online public access catalog service and e-books service, all of which are essential for thorough and current research. These materials' accessibility helps postgraduate students achieve their academic goals by promoting a more robust research environment and enabling effective information retrieval. However, in order to fully realize the advantages of these digital services, issues including occasional power outages, limited computer skills among users/researchers, and unreliable internet connectivity must be resolved. The library can strengthen its role in assisting postgraduate students by investing in better infrastructure and offering sufficient training.

5.7 Recommendations

Based on the findings, the following recommendations are made:

1. The management of Kashim Ibrahim Library at Ahmadu Bello University, Zaria should lay more emphasis on the maintenance and continuous improvement of some digital library services such as: Digital Journal Service, Digital Theses and Dissertation Service, and Online Public Access Catalog Service, Digital Cataloguing and Classification Service; Digital Reference Service, Digital Selective Dissemination of Information Services,
2. The management of Kashim Ibrahim Library, Ahmadu Bello University, Zaria should improve more facilities on the means of accessing digital library services by postgraduate students.
3. The management of Kashim Ibrahim Library, Ahmadu Bello University, Zaria should improve on their existing digital library services in order to ensure their effectiveness and efficiency of postgraduate students in the University.
4. The management of Kashim Ibrahim Library should enlighten more on the utilisation of digital library services through the orientation programs, seminars, and awareness programs organized by the staff members of Kashim Ibrahim Library, Ahmadu Bello University, Zaria.
5. There is need for management of Kashim Ibrahim Library to provide adequate budgetary allocation for the library and also absolute measures need to be taking with regards to poor internet connectivity and power supply in kashim Ibrahim Library Ahmadu Bello University, Zaria

5.8 Suggestions for Further Studies

1. Investigate the impact of digital library services on research productivity and quality among postgraduate students.

2. Conduct a comparative study of digital library service utilisation among postgraduate students in different faculties or departments.
3. Study the impact of digital library services on research process and output of postgraduate students.
4. Examine the digital library services needs and expectations of postgraduate students in specific fields (e.g., STEM, humanities).

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APPENDIX I



DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA



Vice Chancellor: Professor Kabiru Bala, B.Sc (Hons) Building, M.Sc. (Bldg. Serv.), MBA, PhD (Const. Mgt.) (ABU), FNIQB, MAPM, MCABE, C. Bldg E. MICI Arb

Head of Department: Dr. Mohammed Habibu, NCE, BLIS, MLIS, Ph.D (ABU)

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Tel: 08174568401/09033706347

P17EDLS8009

2nd February, 2022

The Dean,
Postgraduate School,
Ahmadu Bello University,
Zaria.

Dear Sir,

INTRODUCTORY LETTER: ALHASSAN HARUNA

This is to certify that ALHASSAN HARUNA with Registration Number **P17EDLS8009** is a Postgraduate student in this Department. He is currently engaged in a research work titled **"Utilization of Digital Library Services for Research Activities by Postgraduate Students in Kashim Ibrahim Library, Ahmadu Bello University, Zaria"**. We would be grateful if you could kindly give him the assistance he required for conducting the research work successfully.

Thank you for your cooperation.

Yours faithfully,



Dr. Habibu Mohammed
Head of Department

APPENDIX II
Questionnaire

Department of Library and Information Science,
Faculty of Education,
Ahmadu Bello University, Zaria.
06-02-2023

Dear Respondent,

REQUEST FOR COMPLETION OF QUESTIONNAIRE

I am a postgraduate student in Department of Library and Information Science, Faculty of Education Ahmadu Bello University, Zaria. I am conducting a research titled **‘Utilization of Digital Library Services for Research Activities by Postgraduate Students in Kashim Ibrahim Library, Ahmadu Bello University, Zaria.** In view of the above, I am seeking for your co-operation to kindly fill the attached questionnaire. The information provided will be used only for this research.

Thank you.

Yours Sincerely,

ALHASSAN, Haruna
P17EDLS8410
07039784841

SECTION A: Demographic Information

Instruction; Please tick the option you feel is appropriate.

Faculty.....

1. Gender:

Male () Female ()

2. Program of study

Masters ()

SECTION B; Types of Digital Library Services Access by Postgraduate Students for Research Activities in Kashim Ibrahim Library, Ahmadu Bello University Zaria.

S/N	Types of Digital Library Services	Response
1	Opac/Webopac Service (OPAC)	
2	Digital Cataloguing and Classification Services (DCCS)	
3	Digital Reference Services (DRS)	
4	Digital Selective Dissemination of Information Service (DSDIS)	
5	Digital Theses and Dissertation Service (DTDS)	
6	Digital Journals Service (DJS)	
7	Digital Books Service (DBS)	
8	Digital Document Delivery Service (DDDS)	

SECTION C: Procedures through Which Postgraduate Students Access Digital Library Services in Kashim Ibrahim Library, Ahmadu Bello University, Zaria.

How do postgraduate students through [https://library .abu.ed.ng](https://library.abu.ed.ng) at Kashim Ibrahim Library, Ahmadu Bello University, Zaria access digital library services for research activities?

S/N	Procedure of Accessing Digital Library Service	Responses
1	Through Digital Repositories	
2	Through Subscribed Databases	
3	Through Open Access Databases	
4	Through Free e-book Areas	

SECTION D: What are the Research activities carryout by postgraduate students in Kashim Ibrahim Library, Ahmadu Bello University, Zaria

S/N	Research activities	Response
1	Identification of area of interest	
2	Problem identification	
3	Coining of topic/title	
4	Conducting related literature	
5	Choosing methodology	
6	Conducting analysis and interpretation	
7	Extracting journals articles/conferences	

SECTION E: Extent of Satisfaction of Digital Library Services by Postgraduate Students
To what extent do postgraduate students satisfy the digital library services at Kashim Ibrahim Library, Ahmadu Bello University, Zaria?

S/N	Digital Library Services	Highly Satisfied (HS)	Satisfied (S)	Rarely Satisfied (RS)	Not Satisfied (NT)
1	Opac/Webopac a Service (OPACS)				
2	Digital Cataloguing and Classification Service (DCCS)				
3	Digital Reference Service (DRS)				
4	Digital Selective Dissemination of Information Service(DSIS)				
5	Digital Theses and Dissertation Service (DTDS)				
6	Digital Journals Service (DJS)				
7	Digital Books				

	Service (DBS)				
8	Digital Document Delivery Service (DDDS)				

SECTION F: The Challenges encountered in the course of utilizing digital library services for research activities Kashim Ibrahim Library in Ahmadu Bello University, Zaria.

S/N	Challenges	Response
1	Sustainable Funding	
2	Information Security from the virus	
3	High cost of infrastructure	
4	Slow Speed of the Internet	
5	Building digital collection	
6	Insufficient digital local content	
7	Unsteady Power Supply	
8	Lack of digital literacy	
9	Copy right challenges	
10	Equity of access	
11	Digital preservation	

APPENDIX III

Krejcia & Morgan Sample Size Calculation Table

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	375
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note-N: is population size
S: is sample size

**APPENDIX IV
RELIABILITY RESULT**

Split-half technique was used to determine the reliability of the instrument. A single test was administered but two scores were obtained for the each individual. The sub-scores were then correlated to get the reliability co-efficient alpha of the scale to be 0.81. This shows that he instrument is reliable since the co-efficient is above 0.5.

Case processing summary			
	N	%	
Valid	10	100%	
Excluded	0	.0	
Cases			
Total	10	100%	
Reliability			
Crobach's Alpha	N0 of items		
.81	120		