UTILIZATION OF OPEN ACCESS RESOURCES FOR ACADEMIC PRODUCTIVITY BY ACADEMIC LIBRARIANS IN FEDERAL UNIVERSITIES IN NORTHWESTERN STATES OF NIGERIA

BY

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DECLARATION

I, Musa, Aminu Umar hereby declare that this thesis was written by me and that it is a record of my own research work. This work has not been presented in any previous application for a higher degree. It is my original work. All works cited are specifically acknowledged by means of references and all quotations are indicated by quotation marks or indent.

Aminu Umar MUSA, ---------- ----------

Signature Date

CERTIFICATION

This thesis titled “Utilization of Open Access Resources for Academic Productivity by Academic Librarians in Federal Universities in Northwestern States of Nigeria” by Musa, Aminu Umar meets the regulation governing the award of the 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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DEDICATION

In memory of my late father, Malam Musa Umar and my late mother, Salamatu Abdulkadir

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ABSTRACT

This research was carried out to investigate the utilization of open access resources by academic librarians for academic productivity in Federal universities in Northwestern States of Nigeria. To achieve the objectives of the study, six research questions were set and answered for the study. Two hypotheses were formulated, and tested. The research questions raised among others include; what is the level of awareness of open access by academic librarians in Federal universities in Northwestern States of Nigerian? What is the level of usage of open access resources for academic productivity by academic librarians in Federal universities in Northwestern States of Nigeria? What factors militate against the use of open access resources by academic librarians in Federal universities in North Western States of Nigeria? The hypotheses formulated for this study were: there is no significant relationship between awareness and use of open access resources for research productivity of academic librarians in Federal universities in Northwestern States of Nigeria. There is no significant relationship between use of open access resources and research productivity of academic librarians in Federal universities in Northwestern States of Nigeria. Survey research method was adopted for the study while structured questionnaire was the instrument used for data collection. The population comprised academic librarians in Federal universities in Northwestern States of Nigeria. Data collected were analyzed using descriptive statistics for the research questions and for the hypothesis Person's Product Moment Correlation (PPMC) was used in order to test the relationship between the variables under study. The findings from the study revealed that majority of the respondents indicated high level of awareness about open access publications (OAP). Although they showed some level of awareness and familiarity with OA, their awareness was hinged mainly on the nature and types of open access and not on open access initiatives. The study also discovered that librarians portray high level of usage of open access resources. Even though majority claimed to have accessed open access resources, majority of the respondents acknowledged that they do not make their scholarly output via same source. The study revealed that inadequate funding for building and upgrading ICT infrastructure in academic and research institutions, unstable power supply, unavailability or slow Internet connection, technological barriers from digital rights, lack of sensitization to adopt open access, intellectual freedom issues (such as privacy, copyright, censorship) and lack of Skill on how to use ICT facilities were the major factors militating against the use of open access resource by academic librarians. In view of the above findings, it was therefore, recommended that advocacy on other forms of OA initiatives have become so imperative as this would help in inculcating and improving the level of awareness on open access initiatives. There is also the need for sensitization campaign to encourage librarians to publish via open access models of scholarly communication so as to contribute to the existing body of knowledge not mere consumers. Finally, adequate funding is seriously needed for building and upgrading poor ICT infrastructure in academic and research institutions. Unstable power supply, unavailability or slow Internet connection should be improved. Likewise measures need to be taken on technological barriers arising from digital rights, intellectual freedom issues (such as privacy, copyright and censorship) need to be addressed. Adequate training on skill on how to use ICTs facilities is equally needed. This could be achieved by collaborating with institutions, government agencies, open access related initiatives and agencies.

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LIST OF ABBREVIATIONS

APF	Article Processing Fee
BOAI	Budapest Open Access Initiative
DOAJs	Directory of Open Access Journals
I CT	Information and Communication Technology
MHP	Metadata Harvesting Protocol
OA	Open Access
OAA	Open Access Archives
OAI	Open Access Initiative
OAI-MHP	Open Archives Initiative Metadata Harvesting Protocol
OAJs	Open Access Journals
OARs	Open Access Repositories
PLoS	Public Library of Science
R&D	Research and Development
SPARC	Scholarly Publishing and Resources Coalition (USA and Europe)
SPSS	Statistical Package for Social Sciences

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The emergence of information and communication technology is imperative not only for scholars and researchers doing scientific research but also for the expansion of global science and technology knowledge base. Billions of dollars is invested worldwide in research and development in order to solve scientific, technological and social problems and to advance our understanding of the present and the past (Moller, 2006). Most of these research findings are communicated in scholarly journals that are disseminated on the basis of subscriptions or licenses. In the US alone, the scientific, technical and medical publishing market is estimated at between $7-11 billion (OECD, 2004; as cited in Moller, 2006). With the transformation brought about by the Open Access (OA), different models of scholarly publishing are being developed in order to enhance access and utilization of information resources, manage costs and optimize collaborative research and productivity.

The importance of publication in the growth and development of the library profession, researchers and academic librarians cannot be over emphasized. It is essential for problem-solving, which leads to dynamism in library services as a response to changing times and environment (Ogbomo, 2010). The scholarly information environment is now undergoing profound change as a result of new technologies allowing new modes of research dissemination, changing research practices and needs, and increased focus on research performance (Houghton et al, 2003; 2004; Van de Sompel et. al, 2004; Houghton, 2005a; 2005b). As a result, the traditional publishing system no longer serves well the needs of researchers for uninhibited access to the research findings of others, or the needs of their funders for cost effective dissemination of findings in order to maximize the economic and social returns to their investment in Research and Development R&D (Houghton and Sheena 2006). The development of open access models was a result of what has been observed over the years to respond to risen

costs of publishing as well as the increasing prices of scholarly journals published by commercial publishers (Abdulkadir and Mohammed, 2013).Houghton and Sheehan (2006) opined that identifying access and efficiency limitations under the subscription-based publishing model has dominated scientific publishing.

In an academic set up the importance of research cannot be overemphasized. Current information is very essential for researchers to be up-to-date in their fields. Hence, they depend on scholarly journals to meet their information requirements. The library being the information provider subscribes to journals in various disciplines in accordance with the thrust of the parent institution. But with the tremendous growth of specialization in various disciplines, the number of journals to be subscribed has increased. The prohibitive factor for the library is the escalating cost of the journals and the stringent library budget. This has led to a phenomenon called "Scholarly Crisis", where the libraries have to meet the users growing demands and journal prices (be it print or electronic) are shooting up, and while on the other hand the library budgets are shrinking. At this juncture, "Open Access" (OA) resources have dawned as boom to both the academic users and the library managers (Joshi, Vatnal & Manjunath, 2012). OA essentially means free access for the users. This is generally referred to the documents available on the Web and also called public domain documents. This term is commonly associated with scholarly material. Open Access (OA) means that electronic scholarly articles are available freely at the point of use. This is a recent movement in communication of scholarly research, wherein neither readers nor a reader's institution are charged for access to articles or other resources. OA is also known as open access publishing and free online scholarship (Kumar& Bansal, 2008).

According to Budapest Open Access Initiative (BOAI 2002), the concept of Open Access (OA) refers to "[the] free availability on the public internet, permitting any user to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without

financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself." The only constraint is on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited (BOAI, 2002).

In another definition, Harnad (2008) described the characteristics of Open Access (OA) as "Information, which is free, immediate, permanent, full-text, on-line and accessible." Harnad suggested three main justifications of OA: "to maximize the uptake, usage, applications and impact of the research output of your university; to measure and reward the uptake, usage, applications and impact of the research output of your university (research metrics); and to collect, manage and showcase a permanent record of the research output and impact of your university".

Research is an important ingredient to the development of any nation and most of the research findings particularly in an academic setting are made available through scholarly publications. Chiemeke et al (2009) observed that gradual decline in research output in higher education became noticeable in the late 1980s. The National Universities Commission (NUC) noted that in terms of quality and quantity, the research output of tertiary institutions in Nigeria was about the best in sub-Saharan Africa up to the late 1980s (Karani, 1997). The foundations for research are good research training and motivation, availability of equipment, and good library facilities. At the onset and acceleration of the decay in the system, these ingredients faded away. By 1996, the quantity and quality of research had declined to an all-time low (Okebukola & Solowu, 2001). Summarizing the factors that contributed to this decline from late 1988 to 1996 and subsequent collapse from 1997 to date, Okebukola (2002) maintained that: lack of research skills in modern methods, lack of equipment for carrying out state-of-the art research, overloaded teaching and administration schedules which leave little time for research, difficulty in accessing research funds and diminishing ability of seasoned and senior researchers to mentor junior researchers due to brain drain as the main factors responsible for the decline.

A major issue for academic libraries has been the 'serials pricing crises' of the past two decades, whereby average costs of journal subscriptions have increased exponentially, partially due to the consolidation of journal publishers. Since library budgets have not increased at an equivalent rate to journal prices, the purchasing power of individual academic libraries has decreased, forcing them to cancel subscriptions, to reallocate budget items to maintain subscriptions, or to negotiate licensing agreements whereby access is granted to "bundles" of journals at a lower price per journal. Open access represents another option for libraries to provide access to their institution's scholarly output without the need for expensive journal subscriptions or potentially inflexible license agreements (Hurrell, 2012).

Open Access (OA) is becoming a substitute to traditional scholarly publishing methods. Some researchers and scientists think that their intellectual works and researches should be made available to the world free of cost. Scholarly research has been disseminated through journals in a discipline published by academic societies and commercial publishers. Authors submit their papers to the publishers and they are peer reviewed, edited and published. With the advent of Internet, some of the journals are published in the electronic format. This new media has changed the production and distribution or dissemination of research in the form of journals. It has dramatically reduced the time in between the production and its access. Peer reviewing and editing also takes lesser time as compared to print (Kumar& Bansal, 2008).

The Internet and computer technology have brought a growing trend among the scientific community to make Open Access (OA) to scholarly research. Open access emerged to address the problem of escalating cost of scholarly and scientific journals, which had made their access restrictive (Jain 2012). At present, authors and their institutions produce research output and submit it to the publishing agencies without receiving money from them. Publishers peer-review, edit and prepare research content for publication. Authors get their own output by paying charges to publishers. Publishers are increasing prices of journals every year. Public money is used to provide funding for research, its publication and the purchase of the published

research findings. Public funded research should be treated as a public good. Authors want to make their articles openly accessible to maximize their research impact and update in their research fields (Kumar& Bansal, 2008).

Open access is especially important for research and academic libraries since all academic institutions are research-intensive and a library's main mandate is to support the teaching, learning and research activities of their parent institutions (Jain, 2012). The outcome and the extent of the functions of the academics in creating new knowledge and innovations are forms of research productivity. Research productivity is a means by which academics contribute their own knowledge to the existing body of knowledge. This can be in form of journal articles, technical reports, books, chapters in a book, supervision and training of students, etc. The more research outcome is published in all formats the probability of availability and access to information is assured (Okafor, 2011).

Academics place emphasis on research and publications, not only because it is presumed that research enriches teaching and the learning process, contributing to the body of knowledge, but also because it is a major determinant of institutional prestige (Ochai and Nwafor, 1998) as cited in Alemna, 1998). The issue of research output is of benefit to every nation. This is due to the fact that the wealth and economic progress of a nation depends on the extent of research carried out in that country. Due to this trend, there are various ways of bibliometric studies involving research productivity. Hertzel (2003) opined that bibliometric analysis is a productivity count which is descriptive and involves countries, institutions, time periods and disciplines or subjects while literature usage count which is evaluative involves reference and citation.

There is no doubt about the fact that Open Access provides global visibility for researchers, as their research productivity can be accessed globally free of charge. This will in turn give room for easy share of ideas, results and inventions to build upon. Through Open Access research output can be accessed by wider academic constituency enhancing citation rate

of their publications, for which subscriptions would otherwise be constrained. Houghton and Sheena (2006) observed that there is evidence to show on researchers' benefit of Open Access because it increases the impact of their research in which they invested on. Traditionally, access to journal articles is provided through subscription by learned societies or commercial publishers and the cost of providing access are met largely through subscription fees charged to readers. Open Access provide new means of scholarly research communication, that allows researchers to disseminate their findings and to maximize the impact of their findings by allowing others to access their output for maximum usability and application (Brighton, 2008). It is believed that Open Access enhances educational and research opportunities and brings the world together. Open Access also helps visibility of the hitherto unknown authors. The usage and impact of a researcher's own findings can increase with open access, as does their ability to locate access and use the works of others (Harnad and Carr, 2000). The cost of circulation is largely eliminated with online access to marginal cost of providing access to an additional user which is close to zero. The contemporary research environment and mode of scholarly communication is fast changing. The traditional publishing system no longer serves well the need of researchers for un-inhibiting access to research findings of others, and for the research funders and government research agencies publishing through this medium is not cost effective. Yet most researchers and research funding agencies have not well articulated the benefit of open access publications well enough in its myriad facets.

Therefore, the rationale behind this study is to shade more light to academic librarians in federal universities in Northwestern States of Nigeria on their level of awareness of open access mode of scholarly communication for optimal utilization. The research would also be of significant importance in encouraging academic librarians to use and also disseminate their research outputs via open access model of scholarly communication. This will go along away in creating a benchmark for Nigeria's involvement in myriads open access initiative. Furthermore, the study would identify factors militating against the use of open access resources by academic

librarians in federal universities in Northwestern States of Nigeria so that rightful adjustment and corrective measures could be made where necessary.

Consequently, the outcome of this study would hopefully contribute to providing a ground for discussion on the advantage of open access as an alternative mode of scholarly communication in a developing country like Nigeria.

1.2 Statement of the Problem

Open access (OA) is now going on everywhere across geographical locations in the globe, including Nigeria. Although the global pattern and level of awareness, deployment and utilization may follow the paths of digital advantage, the movement has gained tremendous pace, probably due to increased global access to the Internet, the activities of OA promoters and the pertinence of the mission of the movement. Dulle (2010), while analyzing the open access scholarly communication in public universities in Tanzania, stressed that like in many other developing countries, accessing and disseminating scholarly content is a major problem in public universities in Tanzania.

Accordingly, John (2014) stated that access to scholarly information is the biggest problem in African universities. The dearth of research and development program in African universities, access barriers to high priced scholarly literature and lack of quality research infrastructures have dampened the research spirit in African universities. The west-centered scholarly paradigm and the high costs of scholarly literature, such as journals and books, have kept the intellectual output of Africa under constant check. Dulle et al, (2001) and Chailla (2001) also reported an instance where researchers are unable to gain access to recent subscription based scholarly content due to limited university funding and libraries in particular. Apart from benefiting from several externally financed electronic information resources which are also deemed inadequate and unsustainable, most university libraries do not subscribe to journals from commercial publishers due to financial constraints (Lwoga et al, 2007). John (2014), while giving a close look at the costs of journals in major scientific fields clearly

portrayed the fact that access to a single journal in a particular field itself is very hard to obtain, while procuring enough scholarly information in that particular field remains highly impossible. For example, an institutional subscription to a bundle of seven science journals including *Brain Research* is charged at US$ 20,000, which is almost equivalent to a year's journal budget for most of the African libraries. With the current price structure of scholarly publications and the amount of scholarly literature published worldwide, even the wealthiest institutions cannot purchase access to all the information that their researchers require.

A preliminary investigation revealed that federal university libraries in Northwestern States of Nigeria are facing serious financial constraints where most of the libraries could not afford subscription to scholarly journals due to budget cuts. For example, most of the e-journals in Kashim Ibrahim Library, Ahmadu Bello University, Zaria, apart from *Science Direct* that is fully subscribed by the university management, the rest of the e-journals are either under consortium or supported by international donor agencies. Even the *Science Direct* the university management could not provide comprehensive coverage of all the needed e-journals in the core areas. This has created barriers to information access, fostering a dependence on external funding. open access should present an opportunity for African scholars not only to learn from scholars in various parts of the world but also to share their scientific information with scholars in developed and developing countries around the world and institutional awareness as being responsible for the low uptake of the OA movement and utilization of OA resources in many of the countries in the region including Nigeria (Nwagwu, 2012). Despite the potentiality of OA resources in academic productivity this is not yet fully exploited. Gbaje (2007) found that only 20 percent of those surveyed provide access to open access resources. Meanwhile, open access emerged to address the problem of escalating cost of scholarly and scientific journals, which had made their access restrictive (Jain, 2012).

Due to the significance attached to research and academic productivity in all sectors of the various institutions, academic librarians in public universities should also be expected to

use open access resources and also to conduct research and publish their research results in scholarly outlets. It may be surprising to those who are unfamiliar with librarians' qualifications and information service activities and requirements to expect them to engage in research (Ocholla & Ocholla, 2012). But Verzosa (2007) observed that it is very important for librarians to engage in research, as this adds value to librarianship and improve academic productivity. Unfortunately, shortage of research– oriented librarians and low utilization of Open Access resources is recognized as a problem (Verzosa, 2007), Marjorie, (2000), Sitienei& Ocholla, (2010), Ocholla, Ocholla and Onyancha (2012), despite an abundance of well-educated librarians. Research and research publications complement each other, meaning that academic librarians should not only engage in research, but also publish the outcome of their research because it is important to do so. Despite the potential for open access to resolve the above problems, unfortunately, many academic librarians are neither familiar nor have assimilated the new culture in their scholarly publishing, nor have known the advantages derivable from them in order to maximize their research productivity (Okoye & Ejikeme, 2011).

It is on the basis of the above that the study intends to find out the extent to which academic librarians in Nigerian federal universities utilize open access resources for their academic productivity.

1.3 Research Questions

The following research questions were set for the study:

1- What is the level of awareness of Open Access by academic in federal universities in Northwestern States of Nigeria?

2- What is the level of usage of open access resources for research productivity by academic librarians in federal universities in Northwestern States of Nigeria?

3- What factors facilitate the use of open access resources by academic librarians in federal universities in Northwestern States of Nigeria?

4- What factors influence the research productivity of academic librarians in federal universities in Northwestern States of Nigeria?

5- What types of media do academic librarians in federal universities in Northwestern States of Nigeria use in publishing their research output?

6- What factors militate against the use of open access resources by academic librarians in federal universities in Northwestern States of Nigeria?

1.4 Hypotheses

1- There is no significant relationship between awareness and use of open access resources for research productivity among academic librarians in federal universities in North-western States of Nigeria?

2- There is no significant relationship between use of open access resources and research productivity of academic librarians in federal universities in Northwestern States of Nigeria?

1.5 Objectives of the Study

This study has the following objectives:

1- To determine the level of awareness of open access resources by academic librarian in federal universities in Northwestern States of Nigeria.

2- To examine the level of usage of open access resources for research productivity by academic librarian in federal universities in Northwestern States of Nigerian.

3- To examine the factors that facilitates the use of open access resources by academic librarians in federal universities in Northwestern States of Nigeria.

4- To examine the factors that influence research productivity of academic librarians in federal universities in Northwestern States of Nigeria.

5- To identify the types of media used by academic librarians in federal universities in Northwestern States of Nigeria in publishing their research output.

6- To identify the factors that militates against the use of open access resources by academic librarians in federal universities in Northwestern States of Nigeria.

1.6 Significance of the Study

Access to information is essential in a fast changing global environment where development in research is based on a worldwide collaborative, cumulative, sustained efforts and self-corrective cycle of publishing, accessing and using research output in order to ensure progress in generating further findings, applications and publications. The essence of Open Access (OA) is to make public and researchers have free access and wider usage of their research findings. Through Open Access, they have a significantly larger and more diverse audience than that of any subscription-based journal, putting rich and poor on an equal scale, by providing free articles for teaching and learning and as well increase the visibility and impact of their work which would help in maximizing research productivity. Academics in developing countries are fast adapting to the Internet as a source of information for teaching and research. The outcome of this study would create awareness on open access publications to academic librarians, which would hopefully relieve some of the pressures of the serials crisis. It is also expected that the academic librarians would be relieved of subscription issues while conducting research and subsequently appreciate the opportunity of OA roles in enhancing their research visibility and productivity. Similarly, the study would be of significant value to academic librarians in Nigerian Federal Universities because it would improve their level of awareness and usage of OA publications and as well eliminate the problems bedeviling the use of Open Access which in turn increase their research productivity. Lastly, the study would be of significant value to researchers and scholars in Library and Information Science because it would contribute to the body of knowledge in Nigeria and the world at large.

1.7 Scope of the Study

This study covered the utilization of Open Access resources by academic librarians in federal universities in North-western States of Nigeria in relation to their academic productivity.

1.8 Limitation of the Study

Time and funds were considered as factors that militated against the conduct of this research. Likewise, it was not easy collecting the questionnaires back from the various university libraries because the respondents delayed filling the questionnaire due to the nature of the content of the questionnaire, where in most cases they need more clarification on some of the items of the questionnaire especially, on open access initiatives. A lot of follow ups was done before the questionnaires were successfully collected.

1.9 Operational definition of Terms

The following terms are defined for the purpose of this study:

Academic Librarians: Academic librarians are professionals who work in the university library, they manage, organize, evaluate and disseminate information, providing support to members of an academic community including students, researchers and lecturing staff. Also in some instances they teach some courses in the university and their promotion guidelines are the same with lecturers in the university system.

Academic productivity: Is a means by which academics contribute their knowledge to the existing body of knowledge. This can be in form of journal articles, technical reports, books, chapters in a book, supervision and training of students, etc.

Open Access (OA): Is a means of disseminating scholarly and scientific literature over the Internet free of charge to researchers and to anyone else who might benefit from accessing the results of publicly funded research

Open Access journals OAJ: These are scholarly and scientific journals that are disseminated over the Internet free of charge to researchers and to anyone else who might benefit from accessing the results of publicly funded research.

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CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviews the related literature in the area of the study. To successfully do this, the review is presented under the following headings.

2.2 Concept of Open Access and its Publication Models

2.3 Researchers' Awareness of Open Access

2.4 Librarians' Use of Open Access Resources

2.5 Factors Facilitating the Use of Open Access Resources by Librarian

2.6 Research Productivity of Academic Librarians

2.7 Types of Media Used by Academic Librarians in Publishing their Research Output

2.8 Factors Militating Against the Use of Open Access Resources

2.9 Summary of the review

2.2 Concept of Open Access and Its Publication Models

The concept of open access is still not widely known among researchers from different geographical localities and research disciplines. Defining open access is not a trivial task yet Open access (OA) is a simple concept as expressed by (Suber, 2010). There are so many definitions of OA that are broadly understood to mean making materials accessible to users at no cost (Giarlo, 2006) but more specifically, as Giarlo (2006) explained, OA is used to describe a model of scholarly communication in which users may freely view, download, copy, and print scholarly articles, books, conferences proceedings, squibs and so forth. This implies that the users are able to freely access scholarly materials because the price of publication has been assumed by another party, usually the author, the author's institution or grant which funded the research. As a simple concept Suber (2010), defined OA as "Open access literature as digital, online, free of charge, and free of most copyright and licensing restrictions." Although open access is a concept that is most often applied to online publication, it is nonetheless compatible

with print for those journals that also have printed versions. Open access is free of charge for readers of the online version, but does not exclude priced access to print versions of the same work (Ricardo & Mercè, 2004). According to Harnard (2013) OA means free online access to peer-reviewed research journal articles.

According to Morrison (2012) still, like many a simple concept, there is much more to open access than this definition suggests. For one thing, there are numerous sub-concepts within the overall concept that make it difficult to separate open access from related and often overlapping movements and trends. Examples of such overlapping trends are open source, free software, open data, open education, open research, creative commons, and open government. To fully understand open access discussions it is essential to know something about lobby and its tactics by influential, powerful and wealthy publishers which further complicated and as well opposed to the idea of open access. The scholarly peer-reviewed journal article initial focus of the open access movement, the reason for this focus is that the peer reviewed journal article has traditionally been given away by scholars, avoiding the complexities of royalties associated with scholarly monographs. A movement for open access to scholarly monographs has emerged more recently.

According to Frandsen (2009) several political actions taken to support open access have resulted in a number of declarations. Suber (2008) opined that the Budapest (February 2002), Bethesda (June 2003), and Berlin (October 2003) definitions of open access are the most central and influential for the OA movement. They are collectively termed the BBB statement. According to the Budapest (February 2002), Open Access Means:

> [Literature which is freely available] on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself.

> The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited (Budapest Open Access Initiative, 2002)

To achieve broader open access to research similar international statements were devised that further supported these initiatives; including The Bethesda Statement on Open Access Publishing (2003), Open access is defined by the Bethesda Statement on Open Access Publishing as follows:

> An Open Access Publication is one that meets the following two conditions:
>
> [1] The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, [2] as well as the right to make small numbers of printed copies for their personal use.
>
> A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving (for the biomedical sciences, PubMed Central is such a repository).

The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003) being the third "BBB definition" of Open Access came up as a result of such broad, international commitment, According to Frandsen **(**2009), The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities is the most recent of the three definitions.

Following a three-day conference in the Harnack House of the Max Planck Society in Berlin, the declaration was signed by the invited attendees from German and international research organizations that commit to implementing this definition of open access can sign on to the declaration with the following definition of open access:

> Open access contributions must satisfy two conditions: The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.
>
> "A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, inter-operability, and long-term archiving."

These series of international meetings were held from 2002-2003 in Berlin, Bethesda and Budapest. The purpose of these meetings was to bring together like-minded individuals and organizations with a common desire to make scholarship freely available online, and to work out a common term and definitions (Morrison 2012)**.** The Budapest Open Access Initiative (2002), the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

(2003), and the Bethesda Statement on Open Access Publishing (2003), all include very similar definitions of open access, so that collectively this is referred to as “the BBB definition” of open access. There is more to the Budapest, Berlin, and Bethesda (BBB) statements than defining open access; each statement includes strategies for, and commitment to, implementing open access. The Budapest definition is the first and most succinct of the definitions of open access, from the Budapest Open Access Initiative (2002).

According to Morrison (2012) the only element considered missing from Budapest is “immediate” open access, addressed in the subsequent Bethesda statement. For instance, when publishers make back issues freely available, they are expanding access, but this is not full open access. To avoid confusion, it is best to refer to this approach as free access to back issues.

Bailey (2006) noted that, in contrast to the Budapest Open Access Initiative (BOAI), the Bethesda Statement introduces the use of a license, specifies the creation of derivative works, and requires the deposit of open access works in digital repositories run by "well-established" organizations. The specification of "small numbers of printed copies" for personal use is also new.

According to Frandsen **(**2009) these three definitions of open access differ only slightly and because they agree in the substance they are referred to collectively as the BBB statement (Suber, 2008a). According to Suber (2004b) “[n]early all OA proponents agree on the BBB definition”, nevertheless he acknowledges that the term is diluted and “true open access” is debatable. He argues that among other reasons for this dilution is that the definition leaves room for variation. An example of that variation is noted by Harnad (2006) Who stated that his definition is the same as that of the Budapest convention that open access gives free online full-text access to peer-reviewed literature. This definition is missing two important words though, “immediate” and “permanent”.

Consequently, he argues that it is not adequately included in the definition when and how long access should be provided. Another element in the definition that is debatable is whether or not a publication should be peer-reviewed to be included (Frandsen, 2009).

Type of Open Access Sources/Resources

The model of open access that exists is divided into two broad types (OASIS; Albert, 2006; Rossini, 2007 & Ghosh, 2009) they are the open access journal ("gold road") and open access repositories or institutional repositories ("green road"). Examples of open access journals include “Library Philosophy and Practices”, while a directory of open access journals has been developed by Lund University Library after the First Nordic Conference on Scholarly Communication in Lund / Copenhagen in 2002. In more specific terms, Harnard (2013) stated that there are two ways authors can provide OA:

i) By publishing in a journal that makes its articles freely accessible online (this is called OA publishing, or (“**Gold OA**”) or

ii) By publishing in any journal at all, and making their peer-reviewed final drafts freely accessible online by self-archiving them in an OA repository upon acceptance for publication (this is called OA self-archiving or (“**Green OA**”).

OA journals follow procedure of peer-review for their contents. These journals are published to make their contents online free immediately after publication. This is also called as the “golden” road to OA. Some of the publishers such as BioMed Central and the Public Library of Science are providing OA journals. Directory of Open Access Journals (DOAJ) defines OA journals as journals that use a funding model that does not charge readers or their institutions for access (Kumar and Bansal, (2008).

Green OA (self-arching or repositories) involves simply making research output freely available on the World Wide Web. They may belong to institutions, such as universities and laboratories or disciplines such as chemistry and biology. They do not perform peer-review. They may have preprint and post print or both. This is also known as the "green" road to OA.

Preprint is pre-peer-review article submitted to a journal. Post prints are articles which are post-peer-reviewed. Both pre-print and post-print in electronic format are called e-prints (Kumar & Bansal, 2008).

Pinfield (2008) delineated on the two major models of Open Access in practical terms. OA is normally thought to be achievable via two routes: OA journals and OA repositories. OA journals are normally very much like traditional subscription journals in terms of content and presentation. They often contain peer reviewed, edited articles that are presented in periodical parts. However, they are usually funded in different ways, typically either by sponsorship or by publication charges. A publication charge is normally paid before publication by the author (or more accurately via the author by their institution or funder), and the article is then made available on OA. One recent variant of this business model is the so-called 'hybrid' model. Where some authors have paid to make their papers OA but other papers are published under a traditional subscription model (where payment takes place on the reader side).

OA repositories on the other hand do not require a new business model, although some have suggested that as more content is made available in them new ways of paying for the production of the content will emerge. Repositories can be set up by subject communities, institutions, or other stakeholders, to collect material which (in the case of research outputs) is usually formally published elsewhere. A repository will contain electronic copies of journal articles (so-called 'eprints'), either in a form before they have been refereed ('preprints') or after ('post prints'). Repositories can also house other content including data, conference proceedings, and learning objects. Repositories are usually set up using international standards which mean they can interoperate; effectively creating a global network of interlinked repositories.

Morrison (2012) stated that publishers can make a work open access as part of the process of publishing. This is sometimes called open access journals, open access monographs, or gold open access. Or, a work can be placed in an archive or repository in order to provide

open access; this is sometimes called self-archiving or green open access. These two approaches are compatible. An article can be published in an open access journal, and also deposited in an open access archive. There are two key aspects of free in the major definitions of open access, and there are two corresponding sub-definitions of open access, reflecting this distinction. Suber (2008b) coordinated the discussion that led to the distinction between gratis and libre open access.

• Gratis open access: free to read / free of charge

• Libre open access: free to read / free of charge, and free of at least some copyright and licensing restrictions / free for re-use

According to Morrison (2012), in practice, there are many variations on these themes. There are items that are free to read online, but not to download or print. There are documents that are free to read, print, or distribute, as long as the usage is not commercial in nature. Derivatives are allowed with some open access works, but not others. This distinction is important. Scholarly communication is in transition. The majority of scholarly journals, whether subscriptions-based or open access, are neither fully closed nor fully open. Most subscription-based journals allow authors to self-archive, and many provide free access to back issues. Open access journals range from "just gratis," to "fully libre," with many shades in between. As Willinsky (2006) notes in his book, "The Access Principle", open access can be seen as a continuum. Libre open access may be optimal from the standpoint of information dissemination, but it is much better to have a work that is free to read than one with a toll to access that you cannot afford to pay.

Collectively, various definitions of open access have been discussed in the existing literature, this has expanded the way the scholars communicate and share findings. This new model of communication serves as a mechanism to address escalation of journal prices and limit of access to the increase volume of literature. Therefore, researchers in a developing country like Nigeria would benefit from publicity funded research and this can lead to fast and easy

exchange of information and increased potentiality for collaboration among academic librarians in Nigerian federal universities and the world at large.

2.3 Researchers' Awareness of Open Access

Scholars in Africa and other developing regions should no longer mourn the unavailability to research outcomes from the developed world. This is because, on a daily basis, both older and newer in-lab and out-of-lab information materials–books, serials, gray materials and others– are uploaded onto the Internet, and downloaded by other scholars and researchers (Nwagwu, 2012). Ogbomo and Ivwighreghweta (2010) reported that some studies indicated that open access is an unknown concept to many researchers. These studies include those conducted by Swan and Brown, (2004) Kim (2006) Christian, (2008) and Nwagwu (2012) who examined the structure of homegrown initiatives, and observed very low level of awareness prevailing in higher educational institutions and research institutes, organizations and governments. A study by Christian (2008) for example, reveals that while only 3% of 66 respondents at the University of Lagos were aware of the concept of open access journals, 22.7% knew very little about it and majority (i.e. 74%) of the respondents were completely unaware of it. Another similar study involving 27 Universities in Canada revealed that from among 32 survey respondents, 66% had some kind of familiarity with the term open access (Greyson et al, 2009).

A study conducted by Obuh and Bozimo (2012) the result from the analysis to responses from the respondents showed that most of the respondents, who were LIS lecturer in southern Nigerian indicated a high degree of awareness of open access publications. Even though the result shows fairly high level of awareness on open access publications by lecturers of LIS in southern Nigeria, it is clear that, their awareness hinged mainly on the nature and types of open access and not on open access initiatives. Most of the items on awareness of open access initiatives in the current study such as awareness of Bethesda Statement on Open Access, Berlin Declaration on Open Access to Knowledge, BioMed Central Charter on Open access and other key initiatives like Open Access Initiative Protocol for Metadata Harvesting (OAI-PMH),

and OA search tools such as OAIster and Citeseer recorded negative responses in terms of awareness from the respondents. In a similar study, Sanchez-Tarrago and Fernandez-Molina (2009) found variances in the knowledge of open access related initiatives among scholars from a group of health researchers in Cuba. In another similar situation, Dulle (2008) found that the most commonly known terms or initiatives by researchers were open access journals and open access repositories. Very few respondents knew about specific open access initiatives such as Budapest open access initiative, Open access movement and the OAIster. Likewise, a study by Papin–Ramcharan and Dawe (2006) also reported a low level of awareness of OA initiatives by the Social Sciences sector at Brescia University in Italy. The low level of awareness of OA in Southwestern Nigeria could be tied to the fact that the Internet is quite new and still in its infancy in terms of development in many developing countries (Obuh & Bozimo, 2012).

Ogbomo and Ivwighreghweta (2010) observed that there are several ways through which researchers who claimed to know about open access publication got the information. A study by (Pelizzari, 2003) indicates that colleagues, Professional literature and libraries have been the main sources of learning about open access to those who claimed to be aware of it. On the other hand, self-archiving by their peers, open access debate, institution or library and established subject-based archives promotions were established as being the main means through which researchers were exposed to open access publications (Swan and Brown, 2005).

The most common ways in which open access related terms had been discovered include searching the Internet, participation in debates or via colleagues in their disciplines (Allan, 2005) Swan and Brown (2004) carried out a survey of two groups of authors, those who had published in open access journals and those who had not. They found that the prime reason authors had not submitted to open access journals was that they were not aware of suitable titles in their fields. In the same vein Ramachandran and Scaria (2004) reported that poor level of awareness of open access publications among scholars in Nigeria is a prime obstacle to optimizing and strengthening open access in Nigeria and other parts of the developing world.

Since most of the open access resources are located in the World Wide Web, it will require access to the web to be able to appreciate their immense benefit, even those who have access to the Internet may not necessarily be aware of the existence of the open access technology, while those who are aware of it may have a misconception of it (Chan & Kirsop, 2001).

Sanchez-Tarrago and Fernandez-Molina (2009) found that the respondents were informed about open access through colleagues (40%) and professional literature (37%) in their fields of research. In concurrence with the above findings, several other studies have acknowledged other ways through which respondents were exposed to open access publications These include: University/library websites; contact from institutional repository staff member, publicity through campus newspapers; results of a web search engine/Internet; direct publicity from publishers; word of mouth from associates; and participation in an initial meeting of institutional repository (Kim, 2006; Moller, 2006).

Summarily, various aspects investigated in the existing literature shows lack of awareness on open access research movement and initiatives have strongly affected the opinion of most researchers in most developing countries including Nigeria. In trying to provide a springboard for open access among Nigeria's academic librarians in an attempt to improve the level of their intellectual output, the will require a lot of advocacy on the potentialities and benefit of open access, which would in turn require scholars to access and also make research available via open access mode of scholarly communication.

2.4 Librarians' Use of Open Access

Usage of open access journals in disseminating and accessing scholarly information has attracted the attention of many scholars in recent years (Ogbomo and Ivwighreghweta, 2010). The usage of open access is highly dependent on scholars being aware of this mode of scholarly communication (Dulle, 2010). However, in certain situations users benefit from open access initiatives without their knowledge of this form of scholarly communication (Papin-Ramchan and Dawe, 2006; Fullard, 2007). While extensive literature can be found focusing on

issues relating to open access publishing from the point of view of libraries and publishers, very little have been done on issues influencing authors' adoption and use of open access (Obuh & Bozimo, 2012)

Many studies have been carried out on the use of open access journals. Mallik, Saxena and Roy (2007) in their study of the usage of online resources found that the respondents or user groups differed in their usage methods of access and in their frequency of use of online resources and that lack of awareness of the library home page could have prevented some users from using the resources (Ojedokun & Owolabi, 2003; Badu and Markwei 2005). Manda (2005) studied the use of electronic resources in Tanzania by academics. He found out that the use was low, due to inadequate end-user training, slow connectivity, and limited access to PCs, poor search skills, and budget cuts.

According to Dinev, Hu, and Goo, (2005), awareness is a pre-requisite to subsequent usage of open access publications unless an individual uses it unknowingly. According to Obuh and Bozimo (2012) observed that "Awareness raises consciousness and knowledge about a certain technology and its personal and social benefits."This view was supported by the study conducted by Dinev, Hu, and Goo, (2005), which established awareness as the central determinant of user attitude and behavior towards technology. In the open access environment, awareness has also been acknowledged as an important factor in determining usage of this mode of scholarly communication. Walick and Brown (2004) Fullard (2007), Liew, Foo and Channupatic (2000) found that many researchers are aware of OAJ and they give preference for and use it against printed articles which confirms the idea that patrons may limit their research to easily available electronic journals simply because of their convenience and regardless of whether other sources would better suit their information needs. Heavy usage of a handful of the most popular titles and extremely low use of the least popular titles of OAJs suggests that library users are exhibiting the same sort of journal preferences in the electronic domain as they have been in print.

Anderson et al (2001) study a journal in trying to determine level of use between print and online version of a journal 'Pediatrics' published by the American Academy of Pediatrics in their study in January 1997, the journal started online-only section of peer-reviewed articles as part of 'Pediatrics'. This online-only section was given the name, 'Pediatric electronic page'. Since July 1998, both the print contents on payment basis and online-only contents available free of charge had coexisted online. The study included articles published in 1997 to 1999. Both print and online articles were included for the purpose. Three major variables i.e. web usage statistics, citations within the biomedical literature, and author perception were used as three major measurements. The study found that online-only articles received slightly fewer citations than print articles and were accessed four times via Web.

A study conducted by Obuh and Bozimo (2012) on the level of usage of OA publications indicated that junior lecturers ranked higher than senior lecturers thus, it could be deduced that junior lecturers in LIS use open access publications more than senior lecturers. This finding is supported by Renwick (2005) whose study on academic rank of authors publishing in open access journals. Revealed that senior faculties were found to author a fewer 46 percent of OA journal articles than 63 percent for junior faculties. Renwick concluded that there was a significant tendency for junior faculty members who are un-tenured to publish in OA journals more than for senior faculty members. Obuh and Bozimo (2012) further reported that both senior and junior lecturers exhibit a similar level in terms of high priority in sourcing OA materials for their work and also in their rate of retrieving OA contents. This finding conforms to Azubogu and Madu (2007) where they discovered that academics in Nigeria are embracing open access resources since libraries cannot satisfy their information needs. Renwick (2005) in a study on the knowledge and use of open access resources by academics in the medical sciences of the University of the West Indies found that there is a high level of usage of open access resources by faculty in their research and professional growth.

However, Obuh and Bozimo (2012) observed that the high level of usage of open access publications by both senior and junior lecturers can only be accounted for in terms of sourcing and retrieving its content for their research work as the result show that both categories of lecturers rarely self-archived their work on the Internet. This finding agrees with Mann, eta l (2008) where they found that despite the fact that 66 percent of the respondents claimed to have used open access publication media to access scholarly works, only 28 percent of them had actually published using the same media. In a similar study, Dulle, Minishi-Majanja and Cloete (2010) reported that fewer Tanzanian researchers disseminated their findings through open access channels than those who accessed free online content.

Harnad and Brody (2004) analyzed OA advantage over non-OA by studying journal articles in Physics indexed by Institute of Scientific Information from 1992-2001. Pre-print manuscripts of some articles were deposited in subject based repository, ARXIV (http://www.arxiv.org). Thomson Scientific Web of Science was used to determine the citation counts to OA articles and non-OA articles and it was found that OA articles had 2-3 times citation counts than those that were not self-archived in ARXIV for the same journal and in the same year. OA articles published in same journals and same year also confirmed that OA articles received more citations.

Gedye (2004) claimed that in an open access era, "a new role for librarians needs to be discussed, defined, and promoted" in order to better apply their research and instruction expertise to facilitate and instruct their users in accessing and evaluating the quality of open access articles. Open access also requires policy and procedure changes, in order to accommodate the additional collections of institutional repositories and open access journals. Subject specialists, bibliographers, and cataloguing librarians need to establish guidelines to perform quality control and regular catalogue maintenance on these titles (Joshi, Vatnal, & Manjunath, 2012).

Many studies have been carried out on the use of open access publication. The major influential factor for the non-usage of open access publication among Nigerian academics is lack of awareness. Awareness raised consciousness to the subsequent usage unless where it's used unknowingly. This implies that strong partnership and advocacy among academics need to be encouraged. This would provide a high level of awareness and subsequent usage of open access publication among academic librarians in Nigerian federal universities. It will also go a long way in curtailing the depressed scenario of stringent library budget and serial pricing crises, since most Nigerian university libraries cannot afford wide array of published research materials for a more enhanced research output.

2.5 Factors Facilitating the Use of Open Access Resources by Librarians

Scholars across the globe make use OA publication and sometimes publish through the same medium for various purposes comprising several facilitating factors and benefit in terms of saving cost of subscription to scholarly journals, research visibility, and increased citation rate. According to Frandsen (2009) as scholars from developing countries have limited access to research publications due to expensive subscription costs, open access has emerged in response to this subscription cost by challenging the constraint to access. One of the implications of viewing authors from developing countries as great beneficiaries of open access is that those authors are more likely to perceive OA positively than authors from developed countries as it enables them to access research that they otherwise would have had limited access to. Correspondingly, authors from developed countries should perceive OA less positively than authors from developing countries as they already have access to the necessary research publications within their field. According to International Scholars Journals (2013), less cost of OA has been one of the purpose of many scholars using OA as the cost of editorial processing and editing fee of each accepted paper is charged to authors' institutes or research funding agency. The cost of processing and the publication of an article are covered through the one-time payment of an Article Processing Fee (APF) for each accepted article. Instead of being

limited to the sources that the university library can afford to purchase, students and lecturers would have full access to a wide array of newly published research materials, as massively reduced serials budgets would enable a better supply of textbooks for undergraduates. According to Möller (2006), open access model of scholarly publishing provides both economic relief and a promise of better quality teaching and learning.

Thus, traditional publishing method inhibits potential scholars and researcher's access to an adequate/sufficient amount of research material which is useful for their research programme. As a result of delays associated with the traditional publishing method, now open access publications provide current information and ensure high citation impact. If there is no access to a research article, it can never be cited OA avoids this hurdle. A study by Kumar and Bansal (2008) indicated that OA articles are being used and cited in research by authors in their respective fields. The study further indicates that OA articles are receiving more citations than print articles. According to Kumar and Bansal (2008), OA helps to increase prestige and recognition of research articles and its authors. Likewise it helps to increase the citation impact of a prestigious journal and as well helps to make scientific research more visible and accessible and increasing their research impact, thereby decreases the time lag between publication and the first citation. Affirming the above statement, Canadian Association of Research Libraries (2013) stressed that open access enables cost-effective, unrestricted flow of ideas and information and underpins excellence in research while also bringing down barriers to learning, building informed communities, and fostering international collaboration and understanding.

Looking at research visibility and publication, Jain (2012), stated that one of the factors that facilitates researchers' use of open access is in the area of research visibility of publications; through open access researchers have wider visibility and usage of their research findings. As research finding were made available online, they have a significantly larger and more diverse audience. Increased exposure to research also increases citation rate. Open access provides an avenue to connect with a global society more easily and researchers can publish

without printing costs. International Scholars Journal (2013) opined that OA publications have high visibility, availability and ensure free and unlimited accessibility of the publication over the Internet without any restrictions. Suber (2010) asserts that Journals and publishers of OA make their articles more visible, discoverable, retrievable, and useful. If a journal is OA, then it can use this superior visibility to attract submissions and advertizement, not to mention readers and citations. Corroborating this, Willinsky (2010) and Suber (2010) stated that OA gives authors a worldwide audience larger than that of any subscription based journal, no matter how prestigious or popular, and demonstrably increases the visibility and impact of their work. Corroborating this statement further, International Scholars Journals (2013) observed that open access publications are more frequently cited due to their high publicity and availability; Frandsen (2009) perceived major benefit for authors making their publications available through OA as it has higher number of citations to publications and presumably due to higher visibility and /or access.

The world is fast changing and academic institutions are now responding to these global changes by adopting Institutional digital repositories as open access model in their various institutions. Florida State University (2012) observed that supporting faculty and researchers by offering greater, more immediate access to peer research will improve the caliber of scholarship that institution produces. International Scholars Journals (2013) reported that it has been argued by open access advocates that open access speeds research progress, productivity, and knowledge transaction. Every researcher in the world can read an article, not just those whose library can afford to subscribe to the particular journal in which it appears. Florida State University (2012) stated that Institution-specific guidelines and models for stewardship of scholarly content are necessary. Florida State University Libraries enter the space of open archives through its newly established institutional repository and ensuring interoperability and standardized metadata is a foundational concern.

The establishment of a repository has the potential between publishers, funding agencies, libraries and researchers, and builds on the infrastructural standardization that the web is constantly undergoing. Harris (2012) asserts that academics place their work and also benefit as they have seen the large number of hits that their papers get by placement in their institutional repositories will help them in uplifting their Profile and international recognition of the parent institution. In Japan the Ministry of Education, Culture, Sports, Science and Technology has encouraged Japanese university libraries to develop institutional repositories to promote sharing of knowledge throughout Japan and internationally (Cullen, 2009), some of the repositories have been very successful. Research by Swan (2006) indicates that Southampton University research has a higher profile as a result of the university's deposit mandate. In addition, institutional repositories serve purposes beyond making research available. As part of the UK's Research Excellent Framework (REF) 5, which is the national exercise to assess the research output of UK universities, libraries are using institutional repositories to collect their institutions' publications. It will be interesting to see whether, once the exercise is over, this practice continues, once academics have seen the large number of hits that their papers get by placement in their institutional repositories (Harris 2012) Jain (2012) asserts that OA helps in the area of uplifting universities profile. Universities benefit from their researchers' increased impact and increase their visibility, OA reduces their journal expenses and advances their mission to share knowledge. It solves the pricing and permission crisis for scholarly journals and also serves library interests in other indirect ways. Librarians want to help users find the information they need, regardless of the budget-enforced limits on the library's own collection. Academic librarians want to help faculties increase their audience and impact, and help the university raise its research profile (Suber, 2010).

Canadian Association of Research Libraries (2013) observed that not only does OA help advance science, but it brings the potential to accelerate the speed at which it progresses. Open access is good for education and good for research; by broadening the dissemination of

the results of scientific inquiry and discourse, it supports the core mission of the higher education enterprise – its ongoing commitment to the advancement of knowledge. Open access incorporates local research into all interoperable network of global knowledge; increases impact of local research, providing new contacts and research partnerships for authors; removes professional isolation and strengthens economies through developing a strong and independent national science base (Antelman, 2004; Nicholas & Rowlands, 2005; Giarlo, 2005, Canada, 2009; Willinsky, 2010; and Suber, 2010)

The creation of new knowledge lies at the heart of the research university and results from tremendous investments of resources by universities, federal and state governments, industry, foundations, and others. The products of that enterprise are created to benefit society. In the process, those products also advance further research and scholarship, along with the teaching and service missions of the university. Reflecting its investments, the academy has a responsibility to ensure the broadest possible access to the fruits of its work both in the short and long term by publics both local and global (Canadian Association of Research Libraries, 2013). Suber (2010) opined that OA increases the return on their investment in research, making the results of the funded research more widely available, more discoverable, more retrievable, and more useful. Thus, OA provides fairness to taxpayers by providing open access to the results of publicly-funded research while there are numerous benefits to distinct groups; all having an interest in research, support for open access policies and mechanisms constitute a critical national investment, economically and socially. Recent research carried out by John Houghton and colleagues at the University of Victoria in Melbourne suggests that enhanced access to the results of publicly funded research will likely result in a greater return on investment in research and development, something that benefits any economy (Houghton and Sheehan, 2006).OA ensures access to peer-reviewed research, which is unavailable in public libraries, and gives them access to the research for which they pay taxes. OA accelerates not only research but the translation of research into new medicines, useful technologies, solved

problems, and informed decisions that benefit everyone likewise Government benefit from OA as funders of research and OA also promotes democracy by sharing non-classified government information as widely as possible (Suber, 2010).

From the foregoing discussion from literature, the main reason for scholar using open access publication is to benefit from varying impact of open access which includes free access to public funded research publication, research visibility, increased citation rate and research collaboration. At this point academic librarians in Nigerian Federal Universities should consider this opportunity to strengthened their research capacities and academic productivity.

2.6 Research Productivity of Academic Librarians

Human beings conduct research every day. They do so in various ways, different theme and in many different settings. One important area is education. Conducting research in an educational setting should be a significant aspect of every educator's professional life and activities. Ocholla, Ocholla and Onyancha (2012) defined research to be a way of finding answers to unknown problems emerging from natural and artificial phenomena, within our environment, through a systematic, logical and verifiable process. What motivates individuals and organizations to conduct research across the board is not uniform. The ideal and, perhaps, main reasons are to find solutions to challenges or problems affecting humanity that stem from natural and artificial phenomena, confirm or contest or refute theories or hypotheses, develop scientific and professional practices, and to develop creative, analytical and rational thinking for informed decision making. On a more practical basis, research is done to fulfill learning, domestic and career needs; to satisfy curiosity; for egoistic reasons, such as recognition and visibility; for career related rewards, such as promotion, securing tenure or permanent appointment; and for self development or growth, among others (Ocholla, Ocholla and Onyancha, 2012) in another definition Best and Kahn (1993) describe research as "the systematic and objective analysis and recording of controlled observations that may lead to the development of generalizations, principles, or theories, resulting in prediction and possibly

ultimate control of events." Research in educational setting is done to improve school practices and at the same time to improve those individuals who strive to improve those practices (Best and Kahn, 1993).

However, study of research productivity has attracted growing attention in the library field for more than fifty years and especially since issues of academic tenure have come to the fore (Schwartz, 1991).Print and Hattie (1997) define research productivity as 'the totality of research performed by academics in universities and related contents within a given time period' Alzahrani (2011) highlighted that academic research represents the backbone of human activity in the way that it improves our quality of life through expanding frontiers of academic knowledge and making further research possible throughout the world. Academic researchers publish to establish their claim to a specific result at a specific point in time. When researchers publish their academic studies, it is an opportunity for their peers to access their research and communicate with other academics interested in a similar subject area Hunter (1998); Besimoglu (2007); Hunter (1998) and Besimoglu (2007) agree that the publication of research results is a significant link between the areas of communication and academic awards, thus academic societies were founded to encourage communication amongst their members.

Research productivity in any university is a major index of a librarian's quality and the determinant of advancement in terms of prestige, recognition for creative thinking, promotion, salary increase and acceptability in the university setting (Edem, 1995; Ochai and Nedosa, 1998; Salaam and Agboola, 2002; Alemna, 1993; Bassey, eta l 2007). In addition, research output provides a good justification for librarians to become successful academics. This is so because research activity develops academic knowledge and as well reinforces the skills for effective knowledge transfer. The quality of research productivity among librarians in any university setting depends largely on quality and quantity of information resources at the university disposals as well as their self-concept (Okonedo & Popoola, 2012).

Indeed, there are various way of measuring academic productivity, this include the use of citation analysis for evaluating or ranking the research performance or productivity of scholars (Cole and Cole, 1967, 1968). While on the other hand rankings based on lists of publications range from simple evaluation systems such as publication counts, to systems that devise certain evaluative or weighting scales for different kinds of publications—books, chapters in books, articles in referred and non referred journals, conference papers, and soon. In some cases, publication length and the reputation or rank of the publisher or journal are taken into consideration as well. The rationale for using lists of publications for ranking library and information science (LIS) schools and faculty is based on claims that scholarly publications produce new knowledge, confer prestige on the university and to the individual researcher, attract better faculty and students, produce better teaching as new knowledge is integrated in to the preparation of students, develop the faculty member intellectually and professionally, and attract research funds (Blake & Tjoumas, 1990; Boyce & Hendren, 1996; Garland, 1991; Wilson,1979).

Okiy, (2000); Salaam and Agboola (2002) stated that most of the research productivity in Nigeria occurs in the university. Indeed, research productivity has become essential for university success and academic's employment and promotion prospects for academic staff including librarians (Okiki, 2011).This is true for librarians in the academic libraries because their promotion is tied to publishing and research (Okonedo and Popoola, 2012). According to Kennedy and Brancolini (2012) librarians in an academic setting are integrally involved with providing research services to faculty, students, and staff of higher education institutions. Okonedo and Popoola (2012) reported that research productivity of librarians in public universities in Nigeria, research productivity of librarians in Nigeria rest largely upon the quality, and often the quantity of research in form of books, journal articles, technical reports, etc. (Alemna, 1993; Nwakanma, 2003; Ochai and Nedosa, 1998).

The level of education, skills, motivation and self perception of academics play an important role in their research productivity. Utulu (2005) affirmed that education and skills acquired in the early days of professional practice also determine the ability to produce scholarly papers. He added that one of the motivating factors for scholarly publications by librarians is the availability of other publications which contain the needed language for publication and how to use them. According to Kennedy and Brancolini (2012), motivation by a desire to help academic librarians improve their research skills and, thus, the quantity and quality of their research is of paramount importance. Ochai and Nedosa (1998) asserted that publication is motivated by eagerness or enthusiasm to publish, presence of enabling environment, self perception of individual librarians with respect to their role, the will power on individual librarian to succeed and the determination not to "perish" in the academic high seas.

Powell (1997) remarked that despite the benefits of publications to librarians, they do not conduct enough research and publication. Cullen (1998) and Molholt (1998) also noted that lack of interest and motivation hinders librarians' scholarly publication. Several studies have shown that librarians in their first 2-3 years of professional life are potentially non-productive years for scholarly publications. Okoye and Ejikeme (2011) also lamented on low research productivity of academic librarians despite the abundance of OA publications. Many academic librarians are neither familiar nor have assimilated the new culture in their scholarly publishing, nor have known the advantages derivable from them in order to maximize their research productivity. This was acknowledged by Okonedo and Popoola (2012) who assert that regardless of some of the motivating factors, librarians do not generally engage in adequate research and publication. Kennedy and Brancolini (2012) observed that despite with the benefits of conducting research and the desire of librarians to conduct research, the reasons that librarians may not conduct research are diverse. One of those reasons in particular has been examined in the literature quite a bit: uneven training in research design. Research training at the master's level is especially varied, leading to an uneven skill set among librarians.

However, a study conducted by Hildreth and Aytac (2007) in a study argued that librarian conduct research. They found, from a sample of 206 articles out of 401 published between 2003 and 2005 in 23 library and information science (LIS) journals, that 47.1 percent of the articles were written by librarians ("practitioner-researchers") alone, 43.2 percent by academics ("academic-researchers" who teach in schools of Library and Information Science), and 9.71 percent by mixed research teams. With regard to quality, Hildreth and Aytac found "little difference in the quality and organization of published reports," but there is room for improvement on the part of both practitioners and academic researchers.

Lertputtarak (2008) observed that there is still an unacceptably low level of research productivity, especially in public universities. Suwanwala (1991); Aina (1997); Oshagbemi (1997); Ochai & Nedosa (1998); Cullen (1998); Molholt (1998) Powell et al. (2002); Sedikadiwa (2005); Utulu (2005); Onohwakpor & Tiemo (2006); Moahi (2008); and Ogbomo (2010) have reported on some other reasons for low research productivity of librarians. These include "failing to understand the purpose of publication, its limitation or how it might be effectively used; lack of time to spending more time in their daily routine jobs than in publishing; ignorance about where to publish; lack of interest; lack of funds; poor education which hinders the acquisition of adequate skills in research and identification of research problems; insufficient knowledge, skills and experience as well as not realizing the importance of conducting research and perhaps their self-concept in the academic community.

There is no doubt that research productivity has attracted a lot of attention and debates among academics resulting from a decline in research productivity among academics in Nigerian Federal Universities. Consequently, open access has gain considerable traction in the recent time for its impact in maximizing research productivity. Ironically, academic librarians in Nigerian Federal Universities need to consider this development in order to exploit the benefit and potentials of open access publications. They also need to adopt and adapt to this changing

model of scholarly communication. This would better improved efficiency and research performance among academic librarians in Nigerian Federal Universities.

2.7 Types of Media Used by Academic Librarians in Publishing their Research Output

Librarians throughout the world use various media to publish their research findings. Ogbomo (2010) opined that librarians produce different types of publications and products, including newsletters, journals, bulletins, fact sheets, reports, summaries, guides, video recordings, conference proceedings, books, bibliometric and technical reports, etc. Different types of publications have different purposes and a different audience. Journals can usually be divided into three broad categories: scholarly journals, popular magazines, and trade publications

Librarians most often publish in referred and non-referred journals in the LIS field. These publications include work done by librarians in the course of carrying out research (Ogbomo, 2010). Many related studies such as Ocholla (2007); Ocholla and Ocholla, (2007); Onyancha (2007); Sitienei and Ocholla (2010) reported that journals are leading medium of scholarly publications.

Swan (2006) observed that the most formal and systematic subset within the array of scholarly communication mechanisms encompasses the peer-reviewed journals and conference proceedings, the contents of which form the official information of record in most disciplines. Until the 1990s, scholarly journals were published almost exclusively in printed form. Pioneering journals appeared in electronic form as a supplement to the hardcopy form through the nineties and, as resistance to electronic publishing dissipated, electronic-only journals were launched. Initially, the resistance – or perhaps informed wariness is a better expression – was based upon concerns both of librarians, who questioned whether these digital publications would be permanently and accessibly archived, and of the research community which debated whether electronic-only journals represented legitimate avenues for publication and whether they would be taken into account in career and tenure decisions.

The emergence of e-journals simplified some of the problems faced in the process of publishing, accessing and utilizing publications. The electronic journal is a version of the traditional print or paper-based journal which is disseminated electronically in some form or the other directly to the end-user. Although electronic journals have been in existence since 1976, full-fledged e-journals came into limelight only in the 1990s. One study identified 30 scholarly e-journals in 1991, which by 1997 have increased to 2,500. Most of these belong to science and technology and there are many more in the humanities and social sciences (Hitchcock et al., 1996).

Swan (2006) further highlighted that the lure of electronic journals was strong, their successful adoption was user driven. They provide inestimable advantages in being accessible from a computer at any time of day or night, in a convenient way, saving busy scholars the time and effort spent physically visiting the library. What is more, they include additional functionality that is now considered essential to scholars' workflow– links from references to the original article, links from the text to supporting data or additional graphics, and powerful search ability.

As the concerns about electronic journals waned in the light of their advantages to the user, digital publishing grew and, although in some disciplines print-only journals still persist, in most areas - and certainly throughout the sciences - digital publishing dominates. Even in the arts and humanities, the disciplines that have moved most slowly towards electronic journals, there are now large numbers of digital titles. Project Muse, for example, covers some 250 journals from around 40 different publishers. This is not to say the print format is dead: many librarians consider it is important to hold a print subscription alongside the electronic one for archival reasons (Swan, 2006).

Owens (2002) stressed that this new method could certainly reduce the long "cycle of publishing" of articles in peer reviewed print journals. The inherent problems of print journals could be eliminated if authors migrate from print to electronic medium. However, well

established print journals will continue to attract many scholars because of their inherent quality and credibility. Whatever said and done, publishing still operates largely on an economic model that had evolved when there were fewer journals available in print.

Paradoxically, researchers all over the world use various media to publish their findings. However, the movement toward open access is an outcome of need to optimized free access and wider circulation of research findings. Therefore the implication for academic librarians in Nigerian Federal Universities is that through this medium their research can be maximally accessed and utilized.

2.8 Factors Militating Against the Use of Open Access Resources

Open Access is being bedeviled with numerous problems across regions and localities across the globe, each region and locality with its unique problem and in some instance concord. One of the major constrain facing OA is low level of awareness as noted by Christian (2008). The low level of awareness of open access institutional repository in Nigeria is directly linked to the issue of inadequate advocacy for open access in Nigeria. Even in developed countries; people are yet being sensitized to adopt open access. For Instance in the United States, as the large library organizations continue to stress an open access advocacy role for academic librarians, there has not been a large scale movement of individual librarians to change their own open access behavior (Palmer, Dill and Christie, 2009) (Way, 2010). In another study by Kumar and Bansal (2012) they observed there is a lack of awareness among user community towards Open Access. Okoye and Ejikeme (2011) opined that in spite of the advantages of open access, there are many unresolved challenges associated with its application. Many authors are hesitant to leave established publishers and move to financially unstable OA journals. Meanwhile, traditional publishers may try to retain their dominance by continuing to discredit the OA movement by creating new OA like products (Petricig, 2007).

Joshi, Vatnal and Manjunath (2012) stated that although the open access model has become irresistible, the authors are optimistic that commercial and nonprofit publishers will be

able to overcome the obstacles and remain competitive with open access in order to promote access to scholarly research. Suber (2003)

> "asserted that having suffered from serial pricing crises for so many decades which were posed on researchers by publishers and relief by OA today traditional publishers have reacted by laying a second crisis for libraries and researchers on top of the first The new crisis is still in its first decade and doesn't yet have a name. Let me call it the permission crisis. It's the result of raising legal and technological barriers to limit how libraries may use the journals for which they have so dearly paid. The legal barriers arise from copyright law and licensing agreements (statutes and contracts). The technological barriers arise from digital rights management (DRM): software to block access by unauthorized users, sometimes with the help of special hardware. The permission crisis is a complex quadruple-whammy arising from statutes, contracts, hardware, and software".

While looking at the problems posed by the publisher from another angle Morrison (2012) opined that lobbying and its tactics by powerful commercial publishers is a great threat to Open Access. One example, as reported by Giles (2007) in Nature, that several executives from Elsevier, Wiley, and the American Chemical Society, met with Dezenhall, who subsequently sent some strategy suggestions, to focus on simple messages such as "public access equals censorship", and "attempt to equate traditional publishing models with peer review". Late in 2011, Bill HR 3699, the Research Works Act, was introduced in the United States by Representatives, (Issa and Maloney 2011). This bill would roll back many of the important gains made by the open access movement, and prohibit the U.S. government from requiring open or public access to the published results of research that it funds. Links to extensive commentary and counter-advocacy can be found through the Open Access Tracking Project (2012). The point here is simply to note that because Open Access is viewed as a threat by

powerful commercial interests in publishing it has become a politically contested terrain (Morrison, 2012).

In developing countries, inadequate skills to navigate the internet, ignorance of open access journals facility, unstable power supply and unavailability of internet could exacerbate constraints to the use of open access. For example, because of the poor ICT infrastructure in academic and research institutions in developing countries like Nigeria, it is difficult to sustain the development of institutional repositories. Upgrading ICT facilities require enough financial support (Christian, 2006, Harnard et al 2007; Christian 2008; Canada, 2009). In another studies in India Joshi, Vatnal and Manjunath (2012) reported that challenges in developing countries like India are erupt in the form of lack of adequate funding for building and upgrading ICT infrastructure. All the institutions of higher learning are not equally enthusiastic about establishing and maintaining institutional repositories. Though publicity is being given to OA resources, still many pockets lack total awareness regarding exploiting maximum benefit from them. Smith (2007) looked at South Africa, and found out that insufficient bandwidth was a major problem, and the range of open access journals in the respondents' field of interest was fairly limited.

Looking in to Nigeria Christian (2008), reported that inadequate funding also constitutes another problem, stressing that since most of the academic and research institutions in Nigeria are funded by the government, these institutions continue to grapple with percentage decline in budgetary allocation. Considering the fact that development of institutional repository in this part of the world is a capital intensive project, funding constitutes another major obstacle to the development of institutional repositories in the country's institutions. Adequate funding to build, upgrade and maintain ICT infrastructure is a problem in many developing countries. For example, because of the poor ICT infrastructure in academic and research institutions in developing countries like Nigeria it is difficult to sustain the development of institutional

repositories. Upgrading ICT facilities requires enough financial support (Christian, 2006, Christian, 2008, Canada, 2009).

In another study Christian (2008) observed that inadequate information and communication technology infrastructure is considered as a problem. A major problem in this area is the high cost of Internet bandwidth in the region. This cost results from the use of satellite infrastructure for Internet connection as opposed to much efficient and cheaper fiber optic infrastructure. There is also the problem of inadequate and epileptic electricity supply to power ICT facilities in academic institutions. This situation is corroborated by Jain (2012) who stated that developing countries are confronted with the problem of high cost of ICTs and connectivity and poor telecommunication infrastructure. This makes the actual use of any open access journals, repositories, and implementation of software more difficult (Giarlo, 2005; Canada, 2009). Nwagwu (2012) while discussing OA position of Nigeria's National Universities Commission which manages over 125 universities in Nigeria observed that university administrators often consider that increased access to the WWW means that scholars already have access to sufficient information required to execute their research. Moreover, many bibliometric studies suggesting that scholars in Africa do not produce high quality information that could be marketed in developed countries could also demoralize information sharing.

It has been observed by Dicovitsky (2010) that although developing countries have made significant gains in access to mobile technology and infrastructure for Information and Communication Technology (ICT) in the last few years, they are still struggling to achieve wide access to high speed broadband services. At the same time, price drops for such technologies are not benefitting the worlds poorest. This creates a digital divide between the developing and developed world. Open access movement is goal is to promote wider sharing of scientific knowledge. While it may be argued that the digital divide presents a barrier, nevertheless open access will enhance the possibilities of scientists, medical personnel and agricultural researchers, amongst others in developing countries, to intersect with international scholarly

networks (Möller 2006). Goodman (2005) connected open access with intellectual freedom issues such as privacy, copyright, censorship, and user anonymity. Managing intellectual property rights through alternative publishing agreements is another issue that developing countries are confronted with. For instance, in 2008, the International Institute of Tropical Agriculture (IITA) in Nigeria developed an institutional repository, but the repository could not go public due to some copyright issues. Copyright in research works conducted by the researchers at the Institute was signed away to the commercial journal publishers for the publication. Curiously, the Institute lost the right to make public research works it has funded and now had to negotiate the right from the journal publishers (Christian, 2008). This has been a debatable issue for a long time; there is a need for standardization and proper adherence of an alternative publishing agreement (Harnad et al, 2004). Even in developed countries, people are yet being sensitized to adopt open access.

Although in developing nations open access archiving and publishing acquires a unique importance this could be due to the fact that scientists, health care professionals, institutions, etc often do not have the capital necessary to access scholarly literature. In response to the challenges many librarians have been vocal and active advocates of open access. These librarians believe that open access promises to remove both the price barriers and the permission barriers that undermine library efforts to provide access to the journal literature. Librarians also educate faculty, administrators, and others about the benefits of open access (International Scholars Journals 2013).

The various challenges bedeviling the current revolution of scholarly communication include the need for strong advocacy for this new model of publishing among researchers. Consequently, adequate internet facilities, stable power supply, adequate financial support from government donor agencies and research funder will go a long way in ameliorating some of the challenges raised in the literature particularly in Nigerian Federal Universities and hopefully, it will help in better responding to the challenges to the imperatives for improved quality and

efficient means of exchanging research findings among academic librarian in Nigerian Federal Universities for an enhanced research productivity.

2.10 Summary of the Review

From the review of related literature, it could be rightly pointed out that there are so many definitions of Open Access but the "Three BBB" definitions are the most central and most influential. The Budapest Open Access Initiative (2002), the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003), and the Bethesda Statement on Open Access Publishing (2003), all include very similar definitions of open access, so that collectively this is referred to as "the BBB definition" of open access. In terms of Open Access Model, we have Gold and Green route to Open Access. The first model is Publishing in a journal that makes its articles freely accessible online (this is called OA publishing, or "**Gold OA**") while on the other hand publishing in any journal at all, and making their peer-reviewed final drafts freely accessible online by self-archiving them in an OA repository upon acceptance for publication (this is called OA self-archiving or "**Green OA**"). Human beings conduct research every day. They do so in various ways, different themes and in many different settings. One important area is education. However, it has been argued by different scholar on a shortage of research– oriented librarians which is recognized as a challenge despite an abundance of well educated librarians and as well wealth of Open Access publication. The summary of these challenges it includes among others; Lack of research skills in modern methods, lack of equipment for carrying out state-of-the art research, burden of teaching workload or tenure which leave little time for the research, the lack of financial support for the field of research publishing coupled with difficulties in accessing research funds and diminishing ability of seasoned and senior researchers to mentor junior researchers due to brain drain. Other challenges include lack of information on where to publish and lack of information resources in the university libraries as the major challenges responsible for the decline. Open access (OA) is now going on everywhere across geographical locations in the world, including Africa.

Although the global pattern and level of awareness and deployment may follow the paths of digital advantage, the movement has gained tremendous pace, probably due to increased global access to the Internet, the activities of OA promoters and the pertinence of the mission of the movement. Although low level of awareness is recognized as problem which in most cases inhibits access by researchers, other inhibiting factors include lack of navigation skills, poor support from Government, poor ICT infrastructure and epileptic power supply among others.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodology used in carrying out the research. It is sub - divided under the following topics:

3.2 Research Method Adopted for the Study

3.3 Population of the Study

3.4 Sample and Sampling Procedure

3.5 Instrument for data Collection

3.6 Validity of the Research Instrument

3.7 Reliability of the Research Instrument

3.8 Procedure for Data Collection

3.9 Procedures for Analysis of Data

3.2 Research Method Adopted for the Study

A survey research method was adopted for the study. Ali (2006) stated that survey is a type of descriptive research which uses sample data to describe and explain what is existent or non-existent on the present status of a phenomenon being investigated. Statistics Canada (2003) stated that survey is any activity that collects information in an organized and methodical manner about characteristics of interest from some or all units of a population using well-defined concepts, methods and procedures, and compiles such information into a useful summary form.

Aron (1997) postulated that the purpose of a survey is to collect quantitative information, usually through the use of a structured and standardized questionnaire. Osuala (1987) agreed that survey research uses both large and small populations by selecting and studying the relative incidence, distributions and interactions of social and psychological variables.

The reason for the adoption of this method was that survey method enabled the researcher to collect data quantitatively in order to measure naturally occurring status of open access resources utilization for academic productivity by librarians within the time frame covered by the study. Also, this method would helped the researcher in determining the relationship between "awareness and use of open access resources by academic librarians" and relationship between ''utilization of open access resources and academic productivity'' of academic librarians in federal universities in the Northwestern States of Nigeria so that generalization and inferences could be drawn.

3.3 Population of the Study

Ndagi (1991) said that the population of a research is sometimes referred to as the universe; and it is defined as the entire group whose characteristics are to be estimated. The population of this study consisted of academic librarians in Nigerian federal universities in the Northwestern States of Nigeria. The demographic characteristics of the population of the study are shown in Table 3.1

Table 3.1: Analysis of Academic Librarians in Nigerian Federal Universities in North Western States of Nigeria

S/N	Name of the University	Year of Establishment	No. of Academic Librarians
1	Ahmadu Bello University, Zaria	1962	118
2	Bayero University, Kano	1975	34
3	Usmanu Danfodiyo University, Sokoto	1975	28
4	Federal University Dutse, Jigawa State	2011	11
5	Federal University Dutsinma, Katsina State	2011	9
6	Federal University, BirninKebbi	2013	0
7	Federal University, Gusau.	2013	0
	Total		200

Source: Administrative Units of the University Libraries as at February, 2014.

3.4 Sample and Sampling Procedure

According to Polit and Beck (2001), a sample is a subset of your population which you select representatives as participants in your study. A sample is a subset drawn to represent the relevant attributes of the whole set. This may not necessarily be an individual; it may be an object, event, etc. Considering the size of the population for the study which is reasonable to manage, the researcher decided to take all the entire elements of the population into consideration. According to Neumann (2006), a researcher's decision about the best sample size depends on three issues: the degree of accuracy required; the degree of variability or diversity in the population; and the number of different variables examined simultaneously. In an ideal situation (manageable population, adequate time and financial resources), the researcher is supposed to study the whole population (Dulle, 2010).

3.5 Instrument for Data Collection

Questionnaire served as the instrument for the data collection for this study Malhotra (2004) posited that the questionnaire is a formalized set of questions for obtaining information from respondents. The overriding objective is to translate the researcher's information needs into a set of specific questions that respondents are willing and able to answer. He added that a questionnaire is the main means of collecting quantitative primary data. A questionnaire enables quantitative data to be collected in a standardized way so that the data are internally consistent and coherent for analysis.

Eiselen, Uys and Potgieter (2005) stressed that questionnaires usually form an integral part of descriptive and opinion related surveys. The Questionnaire for this study is divided into two (2) sections. The first section covered demographic data of the respondents while the second section asked questions pertaining to the research questions and the hypotheses raised for the study. The questions employed the Likert Scale of Measurement, asking respondents to choose between a number of categories that gave an indication of how closely they agreed or disagreed with a set of statements. Numerical values were allotted to the

different categories so that the respondent's attitude or opinion could be measured by the total of these numerical values. While the remaining questions were provided with options for the respondent to tick appropriate option that best described their opinions.

3.6 Validity of the Research Instrument

Validity is often described as the degree to which a research instrument measures what it intends to measure. Onukwo (2000) asserted that validity of an instrument means the degree to which the instrument measures the qualities, abilities, skills, traits, and information it is designed to measure. In order to ensure that the instrument provided the data required for this study, the instrument was subjected to face and content validation.

According to Miller (2011), content validity pertains to the degree to which the instrument fully assesses or measures the construct of interest, while face validity is a component of content validity and is established when an individual reviewing the instrument concludes that it measures the characteristic or trait of interest. In order to ascertain the validity of the instrument, the researcher subjected the instrument to experts and research supervisors for checking and making necessary observations, corrections and amendments in order to improve upon the instrument. As Kerlinger (1973) observed that validation by others (experts in the field) is an effective method of validation of a research instrument.

3.7 Reliability of the Research Instrument

Miller (2011) defined reliability as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials. In order to determine the reliability of the instrument, a pilot study was conducted within one week at Kaduna State University. The instrument was tested using split-half method. The instrument's reliability coefficient was 0.8, which indicates that the instrument is reliable as postulated by Oregon Department of Education (2010) a reliability coefficient of 0.8 and higher is generally considered to be good.

3.8 Procedure for Data Collection

The researcher administered and collected the filled questionnaire with the help of two assistants who helped in the distribution and collection of the filled questionnaires' in Usmanu Danfodiyo University, Sokoto and Bayero University Kano. The research assistants were the staff of the respective university libraries. The remaining questionnaires were personally distributed and collected by the researcher. A period of three weeks was used to distribute copies of the questionnaire to the respondents and two weeks to follow-up to collect back the completed questionnaires.

3.9 Procedure for Data Analysis

The data collected for this study was presented and analyzed using descriptive and inferential statistics in order to obtain relevant answers to the research questions formulated and also test the hypotheses respectively. Descriptive statistics in the form of simple percentages an frequency distributions was used for the research questions formulated and correlation was employed to test hypotheses one and two using Person's Product Moment Correlation (PPMC) in order to test the relationship between variables under study; "awareness and use of open access resources for academic productivity by academic librarians in federal universities in the North Western States of Nigeria" and "use of open access resources and academic productivity of academic librarians in federal universities in the North Western States of Nigeria." The analysis was done using the Statistical Package for Social Sciences (SPSS) version 16.The choice of this software was based on its high descriptive and multivariate statistical power for quantitative data analysis (Dulle, 2010). The software has been widely applied by many scholars specifically in technology acceptance and user studies (Ammenwerth et al, 2002; Pelizzari, 2003; Knutsen, 2005; Ifinedo, 2006; Louho, Kallioja and Oittinen, 2006; Al-Zahrani, 2006) and hence considered suitable to this study as well.

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CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSIONS

4.1 Introduction

This chapter presented the results generated from the survey (questionnaire). The first part of the analysis consisted of the demographic variables of the respondents presented in frequency tables and percentages. The second part of the chapter reported results from the analysis of the variables raised from the study research questions' themes using descriptive statistics. The two hypotheses of the study were tested using Pearson Product Moment Correlation (PPMC) and the discussions of the findings were presented in the last section of the chapter.

4.2 Response Rate

A total of 200 copies of questionnaire were distributed to the respondents, 174 (87%) were duly completed and returned. The response rate was high due to the fact that the research assistants used were highly committed and were familiar with the areas so they were able to follow up the respondents to retrieve most of the questionnaires distributed. Table 4.1 and Figure 1 show the distribution and response rate by institution.

Table 4.1: Response Rate

Institution	Distributed Copies of Questionnaires	Returned Copies of Completed Questionnaires	Response Rate (%)
ABU	118	108	54
BUK	34	24	12
UDUS	28	25	12.5
FUD	11	10	5
FUDM	9	7	3.5
FUBKB	0	0	0
FUG	0	0	0
TOTAL	200	174	87

The high response rate for this study was partly attributed to close and frequent follow ups and the fact that the administration of the questionnaire was conducted after rectifying a number of limitations observed during the pilot study.

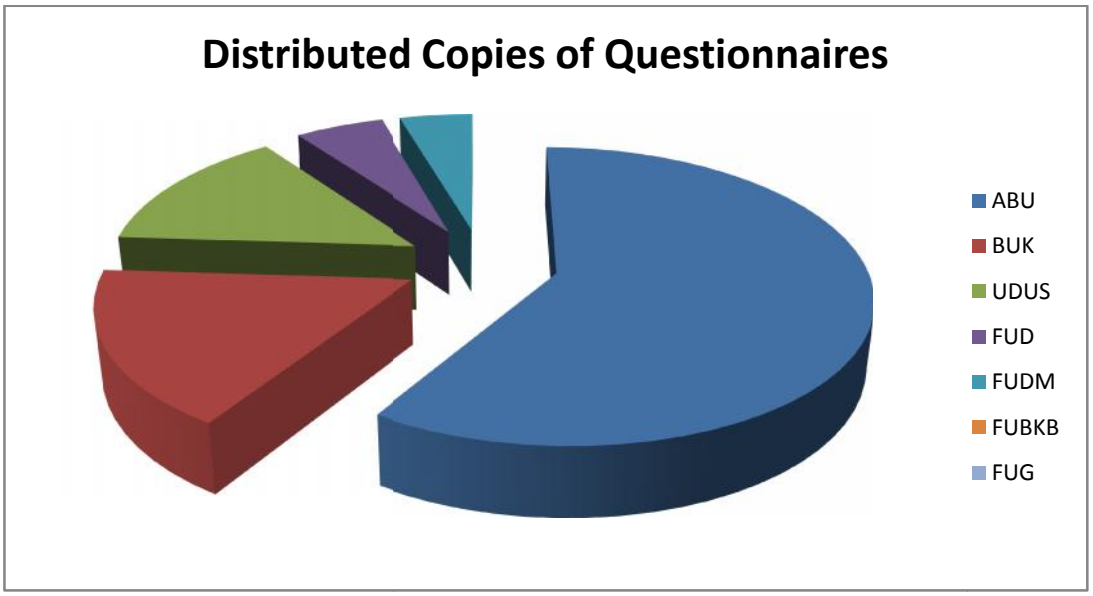


Fig. 4.1: Distributed Copies of Questionnaires by Institutions

Key: ABU - Ahmadu Bello University, Zaria

BUK - Bayero University Kano

UDUS - UsmanDanfodiyo University, Sokoto

FUDM - Federal University Dutsin-Ma, Katsina

FUD - Federal University Duste, Jigawa

FUBKB - Federal University BirninKebbi

FUG - Federal University Gusau, Zamfara

4.3 Data Analysis

This section presents the analysis of the data collected for the study. To achieve this effectively, the data collected for this study were analyzed under two subheadings; descriptively and statistically. Hypothesis one and two were tested using Pearson Product Moment Correlation (PPMC)

4.3.1 Descriptive Analysis

The results from the descriptive statistics addressed the six research questions raised for the study.

4.3.2 Demographic Characteristics of the Respondents

Demographic characteristics of the respondents were variables selected for evaluation, along the opinions of the academic librarians for the utilization of open access resources in Table 4.2. Based on the classification of the respondents by institution, Kashim Ibrahim Library, Ahmadu Bello University, Zaria has the largest number of academic librarians with 108 (54%) responses. It is not surprising to find out that the Ahmadu Bello University, Zaria has the largest respondents because it is among the first generation university and one of the largest in the country. Looking at Bayero University library Kano and Usmanu Danfodiyo University, Sokoto have almost the same number of academic librarians. Out of all the respondents 114 (65.51%) of them were males and 60 (34.48%) were female. This unequal representation of the gender in the study signified that male constitutes the majority of academic librarians in the area covered by the study. The age range of 31-38years constituted the highest respondent with 110 (63.21%) responses followed by 39 – 46 years category with 48 (27.58%), the age range of 23 - 30 and 47 and above were ostensibly few. The implication of this finding is that there is high number of young academic librarians that are within range of 31 to 46 years. Furthermore, analysis from the distribution indicated that, majority of the respondents with 92 (52.87%) responses were Bachelors Degree in Library Science (BLS), followed by Masters in Library and Information Science (MLS) with 53 (30.45%) responses. The findings revealed that academic librarians with Phd and M.phil were ostensibly few with 3 (1.72%) and 4 (2.29%) responses respectively. With regards to working experience, first and second categories that is 1-5 with 120 (68.96%) and 6-10 with 34 (19.54%) have the highest responses respectively. This implies that academic librarians with less than 10 years working experience constitute the majority. Each of these variables discussed was classified in frequencies and percentages in Tables 4.2 and figures 4.2, 4.3, 4.4, and 4.5 below respectively.

Table 4.2: Demographic Characteristics of the Respondents

Variables	Variable classification	Frequency	Percentage
Name of Institution	A B U	108	62.06
	BUK	24	13.79
	UDUS	25	14.36
	FUD	10	5.74
	FUDM	7	4.02
	FUBKB	0	0
	FUG	0	0
	Total =	**174**	**99.97**
Gender	Male	114	65.51
	Female	60	34.48
	Total =	**174**	**99.99**
Age	23-30 yrs	6	34.4
	31-38 yrs	110	63.21
	39-46 yrs	48	27.58
	47 yrs and above	12	5.74
	Total=	**174**	**99.97**
Highest Educational Qualification	BLS	92	52.87
	MLS	53	30.45
	Phd	3	1.72
	M.phil	4	2.29
	Others	22	12.64
	Total=	**174**	**99.97**
Working Experience	1-5	120	69.96
	6-10	34	19.54
	16-20	2	1.14
	21-25	9	5.17
	26-30	7	4.02
	31yrs and above	2	1.14
	Total=	**174**	**99.97**

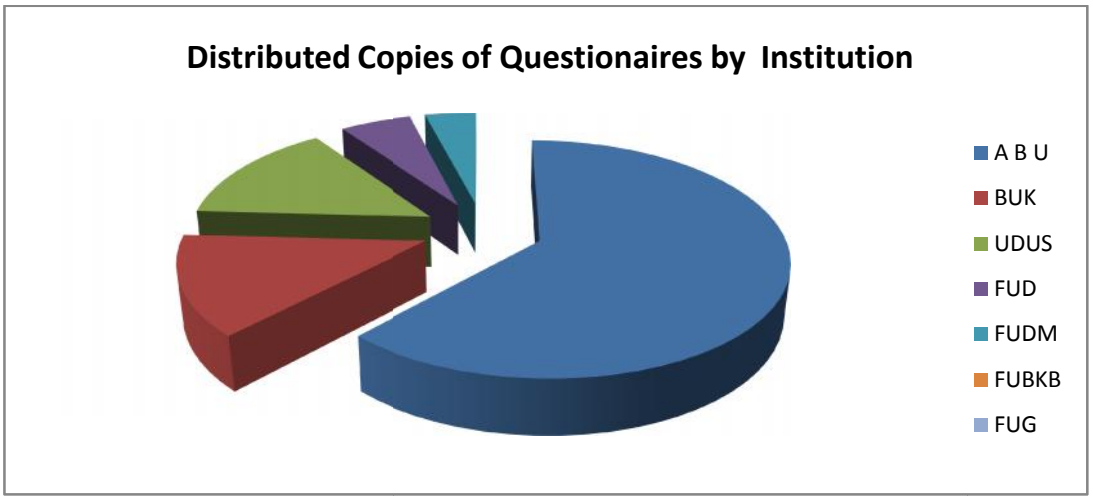


Fig. 4.2: Grouping of the Respondents by Institution

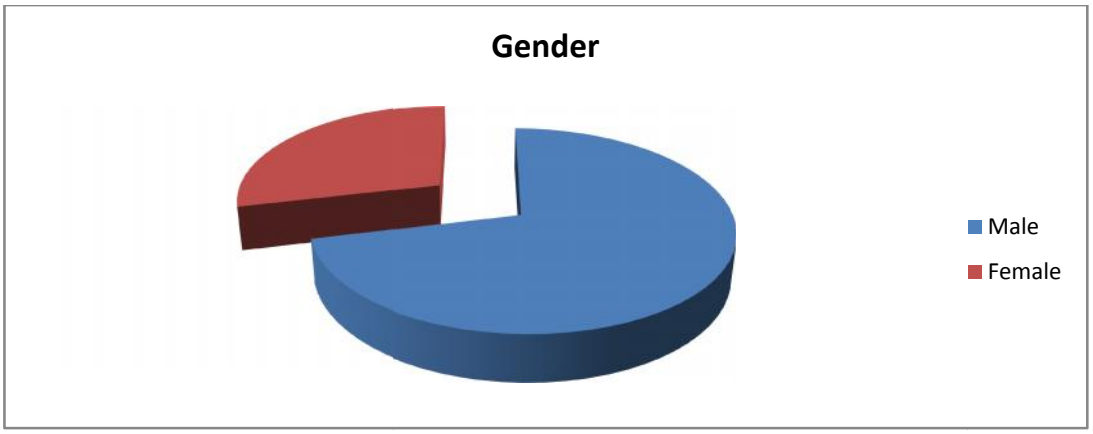


Fig. 4.3: Grouping of the Respondents by Gender

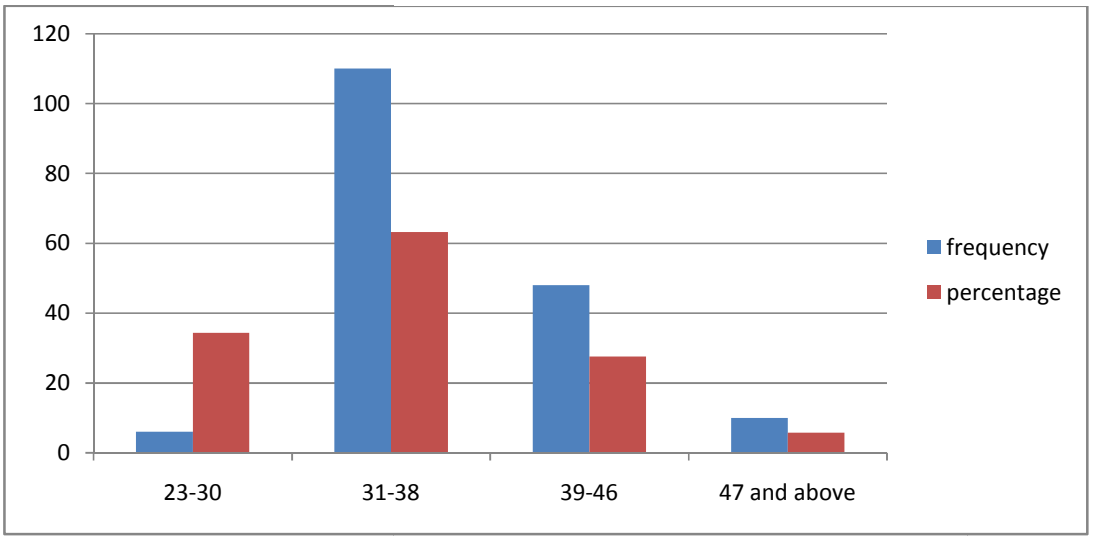


Fig. 4.4: Grouping of Respondents by Age Range

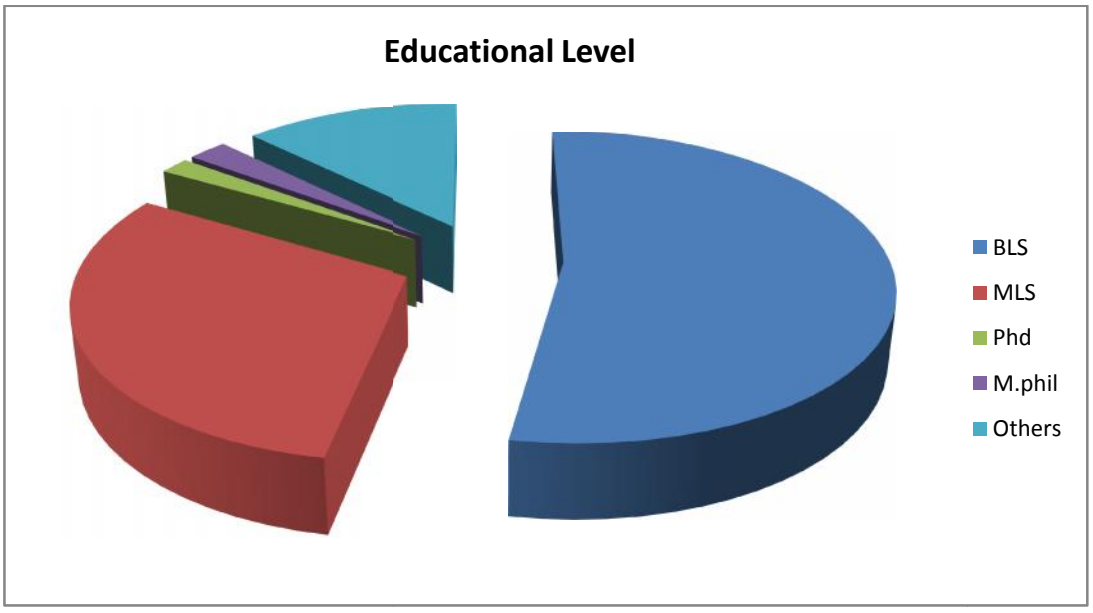


Fig. 4.5: Grouping of the Respondents by Educational Level

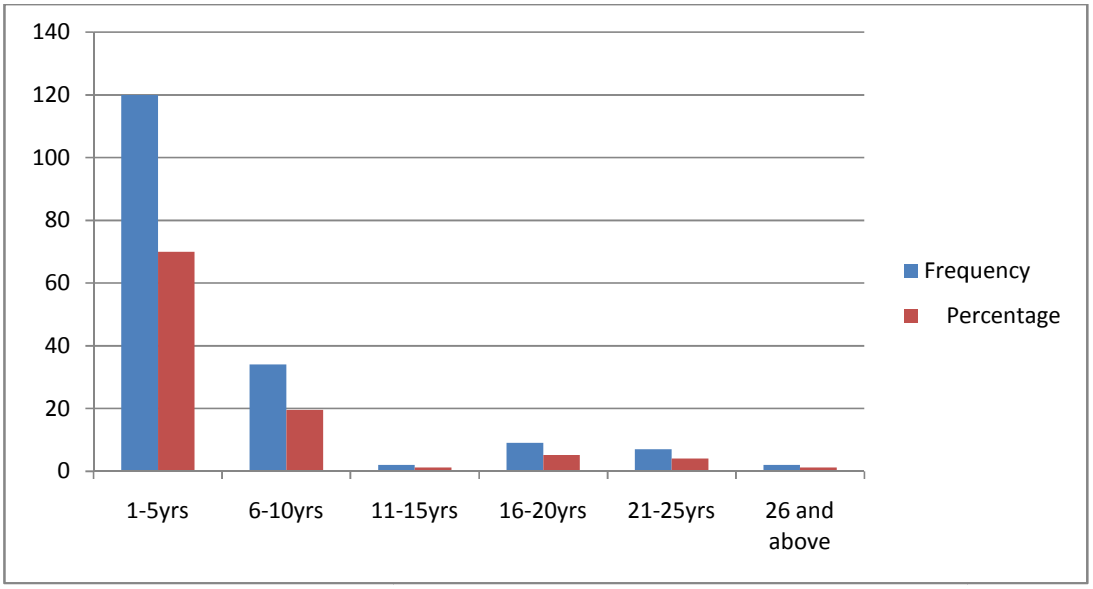


Fig. 4.6: Grouping of the Respondents by Working Experience

4.3.3 The Level of Awareness of Open Access by Academic Librarians

In order to ascertain the level of awareness of open access by academic librarians, the respondents were first provided with a list of options on awareness of open access, the Likert Scale of Measurement; strongly agree, agree, disagree, and strongly disagree was used for the respondents to choose from. Table 4.3 below presents the findings:

Table 4.3: The Level of Awareness of Open Access by Academic Librarians

Level of Awareness of Open Access	**Ratings (Number & Percentage)**			
	Strongly Agree	Agree	Disagree	Strongly Disagree
Aware that OAPs implies free access	87**(50%)**	79 **(45.4%)**	2 **(1.1%)**	6 **(3.4%)**
Familiar with disciplinary archives	31 **(17.8%)**	95 **(54.6%)**	35**(20.1%)**	13 **(7.5%)**
Aware OAPs are in Online/ Electronic format	103 **(59.2%)**	58 **(33.3%)**	4 **(2.3%)**	9 **(5.2%)**
OA are copyright free at the point of use	48**(27.6%)**	89 **(51.1%)**	31 **(17.8%)**	6 **(3.4%)**
Usually peruse contents from OA journals, repositories	24 **(13.8%)**	113**(64.9%)**	29 **(16.7%)**	8 **(4.6%)**
Familiar with initiative Open Access Initiative Metadata Harvesting Protocol (OAI-PMH)	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**
Familiar with OAI	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**
Familiar with BioMed Central Charter on Open access	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**
Familiar with Berlin Declaration on Open Access to Knowledge,	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**
Familiar with Budapest Open Access Initiative (BOAI)	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**
Familiar with Scholarly Publishing and Resource Coalition (SPARC)	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**
Familiar with OAISter	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**
Familiar with Public Library of Science (PloS)	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**

Result from Table 4.3 shows that in most of the items listed against the level of awareness of OA publications are ranked high. The respondents 87 (50%) of indicated high level of awareness (Strongly agree) about Open Access publication (OAP) while 79 (45.4%) indicated awareness (agree). The respondents agreed or strongly agreed that they are aware that Open Access publications are in online format and copyright free at the point of use with 161 (92.5%) responses. 137 respondents representing (78.7%) indicated that they usually peruse contents from OA journals and repositories. Even though, the respondents show some level of awareness and familiarity with OA resources. However, it could be noticed that their level of awareness hinged mainly on the nature and types of open access and not on open access

initiatives as the entire item listed against open access initiatives indicated low level of awareness by the respondents.

Analysis from the research findings indicated high level of awareness on OA resources. This research finding agreed with those conducted by Dinev, Hu, and Goo, (2005), Dulle (2010), and Bozimo (2012) who found out some level of awareness and familiarity with OA resources by their respondents.

4.3.4 The Level of Usage of Open Access Resources by Academic Librarians

Open access usage was investigated to find out the extent to which academic librarians utilized scholarly contents through this mode of scholarly communication. In response to the question on level of usage of open access publications, the respondents were provided with a list of options on usage of open access, The Likert Scale of Measurement: strongly agree, agree, disagree, and strongly disagree was used for the respondents to choose from. Table 4.4 presents the findings:

Table 4.4: The Level of Usage of Open Access Resources by Academic Librarians

level of Usage of Open Access Resources	**Ratings (number & percentage)**			
	Strongly Agree	Agree	Disagree	Strongly Disagree
I often use OA publications in my research	51**(29.3%)**	114 **(65.5%)**	5 **(2.9%)**	4 **(2.3%)**
I usually retrieve scholarly content from OA	62**(35.6%)**	92 **(52.9%)**	12 **(6.9%)**	8 **(4.6%)**
I have submitted many papers to open access journals	32 **(18.4%)**	37 **(21.3%)**	79 **(45.4%)**	26 **(14.9%)**
I usually self-archive my works on the internet	25**(14.4%)**	14 **(8.0%)**	58 **(33.3%)**	77 **(44.3%)**
I only cite and not publish in OA publications	31 **(17.8%)**	95 **(54.6%)**	35 **(20.1%)**	13 **(7.5%)**
OA is usually my first priority when sourcing for materials for my work	36 **(20.6%)**	100 **(57.5%)**	29 **(16.7%)**	9 **(5.2%)**
OA is usually my first priority when deciding on where to publish my work	22**(12.6%)**	81 **(46.5%)**	61 **(35.1%)**	10 **(5.7%)**
I have some publications in open access outlets	11 **(6.3%)**	41 **(23.6%)**	74 **(42.5%)**	48 **(27.6%)**

It can be noted that the results from Table 4.4 show in most of the items listed against the level of usage of OA publications. 165 (94.8) of the respondents agree or strongly agree that they use OA publications in their research activities. Most of the respondents highly used OA publications as they were willing to use Open Access publications as first priority in sourcing OA materials for their work with 136 (78.1) responses. Similarly, the respondents stated that they usually retrieve scholarly content from OA with 154 (88.5%) responses. Even though the respondents highly retrieved content from OA majority do not make their works through open access mode of scholarly communication. For instance, when asked whether they self-archive their works, majority 135 (77.6%) indicated that they do not self-archive their works. Similarly, the respondents stated that they only cited and not published in OA publications with 126 (72.4%) responses. Lastly only 52 (29.9%) agreed or strongly agreed that they have some publications in open access outlets. Majority 122 (70.1) have no publications in open access outlets. The finding revealed that academic librarians in federal universities North Western States of Nigeria accessed and utilized open access resources but they do not publish via same route.

Analysis from the research findings in Table 4.3 and 4.4 indicated high level of awareness and usage of Open Access resources but, their level of awareness hinged mainly on the nature and types of open access and not on open access initiatives. This research finding supported those conducted by Dinev, Hu, and Goo, (2005), Dulle (2010), and Bozimo (2012). This established awareness as the central determinant of user attitude and behavior towards technology. Walick and Brown (2004) Fullard (2007), Liew, Foo and Channupatic (2000) found out that many researchers are aware of open access resources and they give preference for and use it as against printed articles. This confirms the idea that patrons may limit their research to easily available electronic journals simply because of their convenience and regardless of whether other sources would better suit their information needs. Heavy usage of a handful of the most popular titles and extremely low use of the least popular titles of open

access resources suggests that library users are exhibiting the same sort of journal preferences in the electronic domain as they have been in print.

4.3.5: Factors Facilitating the Use of Open Access Resources by the Academic Librarians

The respondents were provided with a number of statements to indicate the factors that facilitate them to use open access outlets. The Likert Scale of Measurement was used: very important, important, somewhat important, less important and not important at all for the respondents to choose from Table 4.5

Table 4.5: Factors Facilitating the Use of Open Access Resources by the Academic Librarians

Factors Facilitating the Use of Open Access	**Importance Ratings (Number and Percentage)**				
	Very Important	Important	Somewhat Important	Less Important	Not Important at all.
Support for access policy	61 **(35.1%)**	70 **(40.2%)**	36 **(20.7%)**	4 **(2.3%)**	3 **(1.7%)**
Satisfying my need for creativity / curiosity	38 **(21.8%)**	90 **(51.7%)**	32 **(18.4%)**	11(6.3%)	3 **(1.7%)**
Access to publication at ncost	67 **(38.5%)**	68 **(39.1%)**	27 **(15.5%)**	3 **(1.7%)**	9 (**5.2%)**
Getting informed to stay current in the field	68 **(39.1%)**	74**(42.5%)**	28 **(16.1%)**	1 **(.6%)**	1 **(1.7%)**
Achieving peer recognition and Prestige	55 **(32.6%)**	49 **(28.2%)**	59 **(33.9%)**	3 **(1.7%)**	8 **(4.6%)**
Satisfying urge to contribute to knowledge	55 **(31.6%)**	94 **(54.0%)**	17 **(9.8%)**	4 **(2.3%)**	4 **(2.3%)**
Currency and timeliness nature of open access	70 **(40.2%)**	57 **(32.8%)**	31 **(17.8%)**	13(7.5%)	3 **(1.7%)**
Getting respect from students	29**(16.6%)**	60 **(34.5%)**	44 **(25.3%)**	21 **(12.1%)**	20 **(11.5%)**
Increase citation rate of your publications	36 **(20.7%)**	77 **(44.3%)**	31 **(17.8%)**	10 **(5.7%)**	4 **(2.3%)**
Limited access to subscription based publications	66 **(37.9%)**	48 **(27.6%)**	41 **(23.6%)**	16 **(9.2%)**	3 **(1.7%)**
Wider visibility of open access publications	67 **(38.5%)**	74 **(42.5%)**	20 **(11.5%)**	10 **(5.7%)**	3 **(1.7%)**
Fostering international collaboration, partnership and sharing	66 **(36.7%)**	68**(39.1%)**	31**(17.8%)**	8**(4.6%)**	3**(1.7%)**
Open access speed research progress and Knowledge	53 **(30.5%)**	72 **(41.4%)**	28 **(16.1%)**	5 **(2.9%)**	16(9.2**%**)
To improve global network and interoperability of Knowledge	47 **(27.0%)**	77 **(44.3%)**	19 **(10.9%)**	6 **(3.4%)**	5 **(2.9%)**

Data analysis from Table 4.5 indicated that almost all facilitating factors were considered by about three quarters of all the respondents as important or very important determinant factors for using open access resources. The support for access policy was considered very important or important as their main factor for using OA resources with 131 (75.3%) responses. Access to publications at no cost with 135 (77.6%) responses. 142 (81.6%) agreed or strongly agreed with the statement that getting informed to stay current in the field as the factor influencing them to use OA. The respondents further stated that satisfying their urge to contribute to knowledge with 149 (85.6%) responses. Specific questions regarding the properties of open access resources such as increase citation rate as influencing factor with113 (65%) responses. visibility and speed, which exposes OA scholarly works to a large potential readership, were the major factor influencing them to use OA publications with 141 (81%) responses. Speed research progress and knowledge sharing with 125 (71.9) responses. Lastly, usage of open access to improve global network and interoperability of knowledge has 124 (71.3%) responses.

This research finding is supported by that of International Scholars Journal (2013) which indicated that OA publications have high visibility, availability, ensure free and unlimited accessibility of the publications over the Internet without any restrictions. Suber (2010) asserts that journals and publishers of OA make their articles more visible, discoverable, retrievable, and useful. If a journal is OA, then it can use this superior visibility to attract submissions and advertising, not to mention readers and citations. Corroborating this, Willinsky (2010) and Suber (2010) stated that OA gives authors a worldwide audience larger than that of any subscription based journal, no matter how prestigious or popular, and demonstrably increases the visibility and impact of their work.

From the foregoing discussion, the main factors facilitating scholar to use open access publication was to benefit from varying impact of open access, which includes free access to

public funded research publication, research visibility, and increased citation rate and research collaboration.

4.3.6 Factors Influencing Research Productivity of Academic Librarians

The respondents were provided with a number of statements about factors influencing research productivity and were asked to indicate the extent to which such factors would influence their research productivity. The Likert Scale of Measurement: strongly agree, agree, disagree, and strongly disagree was used for the respondents to choose from. The analysis is shown in table 4.6

Table 4.6: Factors Influencing Research Productivity of Academic Librarians

Factors Influencing Research Productivity	**Ratings (Number & Percentage %)**			
	Strongly Agree	Agree	Disagree	Strongly Disagree
Gender, have greatly influenced my research productivity.	65 **(37.3%)**	95 **(54.6%)**	6 **(3.4%)**	8 **(4.6%)**
Age, has greatly my research productivity.	95 **(54.6%)**	65 **(37.3%)**	8 **(4.6%)**	6 **(3.4%)**
Marital status has greatly my research productivity.	65 **(37.3%)**	95 **(54.6%)**	6 **(3.4%)**	8 **(4.6%)**
Lack of enabling environment such as collegial commitment, cordial relationship have greatly influenced my research	61 **(35%)**	95 **(54.6%)**	15 **(8.6%)**	3 **(1.7%)**
Positive working area and good facilities has greatly influenced my research productivity	95 **(54.6%)**	61 **(35%)**	15 **(8.6%)**	3 **(1.7%)**
Low level of education, skills and training,	36 **(20.7%)**	97 **(55.7%)**	25 **(14.4%)**	16 **(9.2%)**
Lack of interest has greatly influenced my research productivity.	34 **(19.5%)**	93 **(53.4%)**	11 (6.3%)	36 **(20.7%)**
Attitude towards conducting research has greatly influenced my research productivity.	34 **(19.5%)**	93 **(53.4%)**	11 (6.3%)	36 **(20.7%)**
self- confidence, significantly influenced my research productivity	93 **(53.4%)**	34 **(19.5%)**	36 **(20.7%)**	11 (6.3%)
Low level of motivation has greatly my research productivity.	49 **(28.1%)**	105 **(60.3%)**	12 **(6.9%)**	8 **(4.6%)**
Ignorance on where to publish, greatly my research productivity.	49 **(28.1%)**	105 **(60.3%)**	12 **(6.9%)**	8 **(4.6%)**
Lack of time due overloading teaching schedule and tenure influenced has greatly my research productivity.	105**(60.3%)**	49 **(28.1%)**	8 **(4.6%)**	12 **(6.9%)**

It can be noted from Table 4.6 the questionnaire asked for views on the factor influencing research productivity nearly all the opinions have influence on the research productivity of the respondents. The respondents strongly agreed or agreed that issues like gender, age, marital status have greatly influenced their research productivity with 160 (91.9%) responses each. Also, 156 (89.6%) indicated that lack of enabling environment such as collegial commitment, cordial relationship have greatly influenced their research productivity. Low levels of education, skills and training have significantly influenced the research productivity of the respondents with 133 (76.1%) responses. Accordingly, 127 (72.9%) of the respondents agreed or strongly agreed with the fact that lack of interest and attitude towards conducting research have greatly influenced their research productivity with 154 (88.4%) responses respectively. Lastly, lack of time due overloading teaching schedule and tenure has greatly influenced their research productivity with 154 (88.4%) responses.

The level of education, skills, motivation and self perception of academics play an important role in their research productivity. Utulu (2005) affirmed that education and skills acquired in the early days of professional practice also determine the ability to produce scholarly papers. He added that one of the motivating factors for scholarly publications by librarians is the availability of other publications which contain the needed language for publication and how to use them. According to Kennedy and Brancolini (2012), motivation by a desire to help academic librarians improve their research skills and, thus, the quantity and quality of their research is of paramount importance. Ochai and Nedosa (1998) asserted that publication is motivated by eagerness or enthusiasm to publish, presence of enabling environment, self perception of individual librarians with respect to their role, the will power on individual librarian to succeed and the determination not to “perish” in the academic high seas.

The quality of research output among librarians in any university setting depends largely on quality and quantity of information resources at the university disposals as well as their self-concept (Okonedo and Popoola, 2012).

4.3.7 Types of Media Used by Academic Librarians in Publishing their Research Output

Respondents were asked to indicate their practices with respect to the types of media used in publishing their research output. The counts with respect the types of media can be seen in Table 4.7 and Fig. 4.7 below. The most popular media per publication type is indicated in bold text.

Table 4.7: Types of Media used by Academic Librarians in Publishing Research Output

Media Used in Publishing Research Output	Frequency	Percentage (%)
Print Journals	**140**	**(80.5%)**
Electronic Journals	**123**	**(70.7%)**
Open Access Repositories	**94**	**(54.0%)**
Fee based Journals	**103**	**(59.2%)**
Discipline/ subject repository	**72**	**(41.4%)**
Personal/ dept. homepage	**54**	**(31.0%)**
Open access journals	**97**	**(55.7%)**
Textbook	20	(11.4)
Conference proceedings	10	(5.7%)
Scientific Peer-review bulletin	15	(8.6%)
Seminar paper	**70**	**(40.2%)**
Occasional paper	35	(20.1%)
Thesis/dissertation	50	(28.7%)

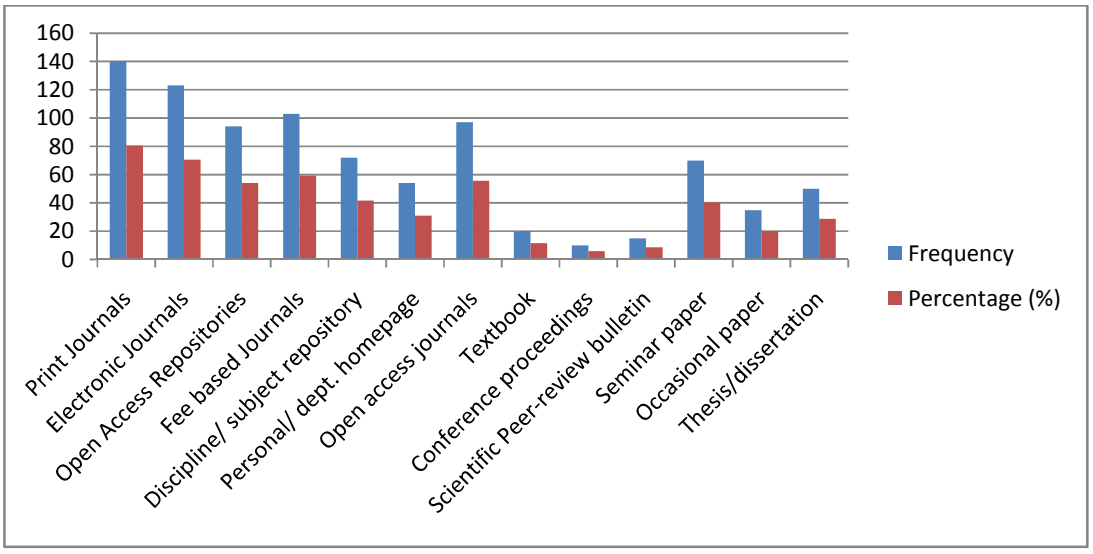


Fig. 4.7 Types of Media Used by Academic Librarians in Publishing Research Output

According to the findings in Table 4.7, reported that printed journals are the leading sources used by academic librarians in publishing their research output with 140 (80.5%) responses. Electronic journals constitute 123 (70.7%) responses. Fee based journals were ranked

higher than open access journals with 103 (59.2%) responses as against open access journals with 97 (55.7%) responses. Accordingly, open access repositories ranked higher than discipline/subject repository with 94 (54.0%) and 72 (41.4%) responses respectively. 54 (31.0%) of the respondents used personal/dept. homepage in publishing their research output. The implication of the above finding is showing low level of support to OA resources and also low priority over discipline/subject repository and personal/dept. homepage through which information would be closer to their immediate users. Lastly, conference proceedings were the least ranked media with 10 (5.7%).

The finding of the research signifies that, in spite of the popularity and numerous advantages of publishing research via electronic means, librarians still give priority to print than electronic media. The advantage of electronic media was further highlighted by a study conducted by Swan (2006) where he stated that the lure of electronic journals was strong and their successful adoption was user driven. They provide inestimable advantages in being accessible from a computer at any time of day or night, in a convenient way, saving busy scholars the time and effort spent physically visiting the library. What is more, they include additional functionality that is now considered essential to scholars' workflow– links from references to the original articles, links from the text to supporting data or additional graphics, and powerful search ability.

The study also agreed with the finding of Swan (2006) as the concerns about electronic journals waned in the light of their advantages to the user, digital publishing grew and, although in some disciplines print-only journals still persist, in most areas - and certainly throughout the sciences - digital publishing dominates. Even in the arts and humanities, the disciplines that have moved most slowly towards electronic journals, there are now large numbers of digital titles. Project Muse, for example, covers some 250 journals from around 40 different publishers. This is not to say the print format is dead: many librarians consider it important to hold a print subscription alongside the electronic ones for archival reasons (Swan, 2006). Paradoxically,

researchers all over the world use various media to publish their findings. However, the movement toward open access is an outcome of need to optimize free access and wider circulation of research findings. Therefore, the implication for academic librarians in Nigerian Federal Universities is that through this medium their research can be maximally utilized.

4.3.8 Criteria for Choice of Journal Outlet When Publishing

The respondents were provided with a number of statements about criteria for choice of journal outlets when publishing. This aspect was investigated by asking the researchers about several issues that were considered when publishing a journal. The analysis is shown in Table 4.8 and Fig 4. 8

Table 4.8: Criteria for Choice of Journal Outlet When Publishing

Choice of Journal Outlet When Publishing	Frequency	Percentage (%)
Prestige – it is on a shortlist of approved journals (Promotion, funding)	**76**	**(43.7%)**
Timeliness – short time from submission to publication	72	(41.4%)
Availability – articles are available for free on the Web	71	(40.8%)
Retrieval – journal is indexed in a free Web database	66	(37.9%)
Citation – the resources will be read by more people	**103**	**(59.2%)**
Benefit – Open Access benefit boosts developing	**86**	**(49.4%)**

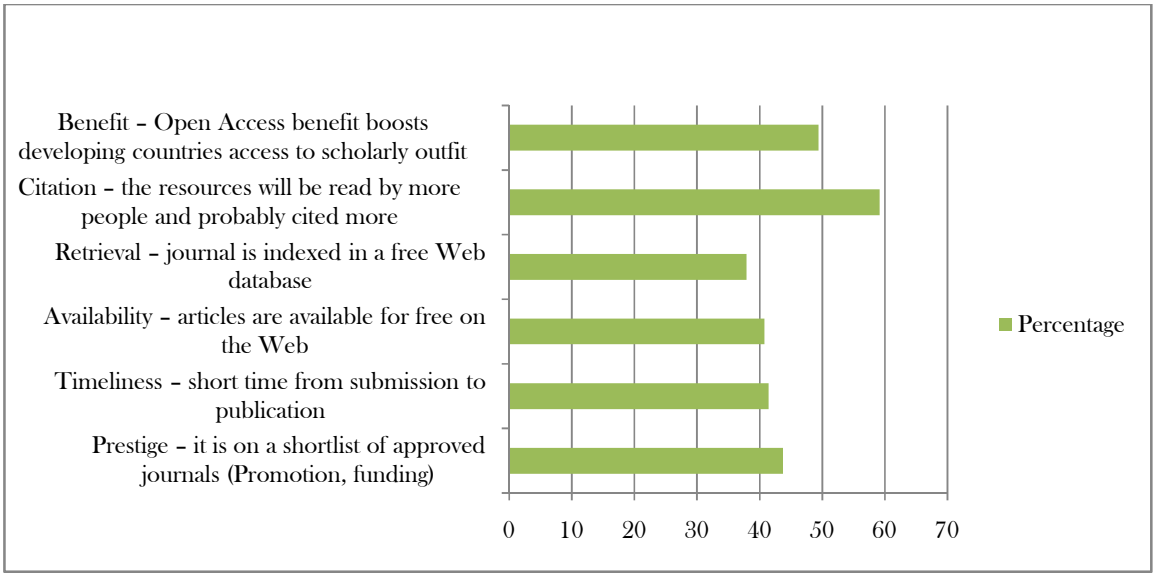


Fig. 4.8: Criteria for Choice of Journal Outlet When Publishing

Table 4.8 indicated that the most popular OA criteria are indicated in bold text. Note with regard to the criteria used to determine which journal an article should be submitted to, majority 103 (59.2%) of the academic librarians cited "Citation – the resources will be read by more people and probably cited" as the primary determinant in exercising choice. A secondary criterion "Benefit – Open Access benefit boosts developing countries access to scholarly outfit with 86 (49.4%) responses. Furthermore, 76 (43.7%) indicated "prestige – it is on a shortlist of approved journals (promotion, funding)". The respondents indicated "timeliness – short time from submission to publication" as their main criteria considered when submitting article for publication with 72 (41.4%). "Retrieval – journal is indexed in a free Web database" as criterion is given low priority. This indicates academic librarians' casualty in depositing mandate to open access (free web) with 66 (37.9%).

This research finding corroborates the finding of DeBeer (2005) who considered the above mentioned criteria for the choice of media when publishing which the present research found that academic librarians also considered those criteria. However, it is imperative to note that several of the top-ranking criteria are factors that determine the promotion, benefit, amount, and character of the readership. Since citation is rated high amongst academic librarians' choice of outlet when publishing, it is interesting to see that academic librarians consider citation as very important element as this adds value to librarianship.

4.3.9 Factors Militating Against the Use of Open Access Resources by Academic Librarians

The respondents were required to state factors militating against the use of open access resources. In order to achieve this, respondents were asked about their reasons for not accessing open access content. The Likert Scale of Measurement: strongly agree, agree, disagree, and strongly disagree was used for the respondents to choose from. The analysis is shown in Table 4.9

Table 4.9: Factors Militating Against the Use of Open Access Resources by Academic Librarians

Factors	**Problem Ratings (number & percentage)**			
	Strongly Agree	Agree	Disagree	Strongly Disagree
Low level of awareness	79 **(45.4%)**	74 **(42.5%)**	9 **(5.2%)**	11 **(6.3%)**
Lack of adequate funding for building and upgrading ICT infrastructure	79 **(45.4%)**	82 **(47.1%)**	11 **(6.3%)**	2 **(1.1%)**
Poor ICT infrastructure in academic and research institutions	67**(38.5%)**	78 **(44.8%)**	22 **(12.6%)**	7 **(4.0%)**
Unstable power supply	71 **(46.5%)**	68 **(39.1%)**	19 **(10.9%)**	6 **(3.4%)**
Unavailability Internet connection	55 **(31.5%)**	85 **(48.9%)**	28 **(16.1%)**	6 **(3.4%)**
Slow Internet connection	55 **(31.5%)**	85 **(48.9%)**	28 **(16.1%)**	6 **(3.4%)**
Technological barriers from digital rights	51 **(29.3%)**	96 **(55.2%)**	25 **(14.4%)**	2 **(1.1%)**
Lack of sensitization to adopt open access	53 **(30.4%)**	86 **(49.4%)**	33 **(19.0%)**	2 **(1.1%)**
Inadequate advocacy for open access in Nigeria	62 **(20.7%)**	88 **(50.6%)**	19 **(10.9%)**	5 **(2.9%)**
Intellectual freedom issues such as privacy, copyright, censorship,	70 **(40.2%)**	77 **(44.3%)**	20 **(11.5%)**	7 **(4.0%)**
Lack of Skill on how to use ICTs facilities	38 **(32.1%)**	71 **(40.8%)**	32 **(18.4%)**	15 **(8.6%)**

Data in Table 4.9 show that almost all factors militating against the use of OA publication were considered as hindrance by about three quarters of all the respondents where they agreed or strongly agreed that low level of awareness 153 (87.9%), lack of adequate funding for building and upgrading ICT infrastructure 161 (92.6%), poor ICT infrastructure in academic and research institutions 145 (83.3%), unstable power supply 139 (85.6%), unavailability Internet connection and slow Internet connection have the same responses with 140 (80.4%) each. Technological barriers from digital rights 147 (84.5%), lack of sensitization to adopt open 139 (79.8%), inadequate advocacy for open access in Nigeria 150 (64.5%) and lack of skill on how to use ICTs facilities 109 (72.9%).

The finding also affirm the finding of Christian (2008), who reported with regard to Nigeria that unstable power supply, inadequate information and communication technology infrastructure, high cost of Internet bandwidth, slow Internet connection, inadequate funding

were considered as problems faced by most academic institution, stressing that since most of the academic and research institutions in Nigeria are funded by the government, these institutions continue to grapple with percentage decline in budgetary allocation. The research is also in agreement with that of Suber (2003) and Goodman (2005) who connected open access with intellectual freedom issues such as privacy, copyright, censorship. Goodman (2005) further stressed that managing intellectual property rights through alternative publishing agreements is another issue that developing countries are confronted with. For instance, in 2008, the International Institute of Tropical Agriculture (IITA) in Nigeria developed an institutional repository, but the repository could not go public due to some copyright issues. Copyright in research works conducted by the researchers at the Institute was signed away to the commercial journal publishers for the publication. Curiously, the Institute lost the right to make public research works it has funded and now had to negotiate the right from the journal publishers (Christian, 2008).

4.4 Inferential Statistical Analysis

This section presents and analyses data collected in respect of the two null hypotheses raised in the study. The researcher used 0.05 level of significance since this level is generally accepted in the social sciences because it involves human beings. The findings are presented below:

Hypothesis 1: H_0 There is no significant relationship between awareness and use of open access resources for research productivity among academic librarians in federal universities in Northwestern States of Nigeria.

Correlations were run on a number of questions for the two hypotheses set for the study, These correlations below have the null hypothesis as starting point, which says that there is no relationship between variables i.e. $r = 0$. A 5% significance level ($p < 0.05$) as guideline for determining significant correlations.

Table 4.10: Pearson Product Moment Correlation (PPMC) Statistics to Test the Relationship Between Awareness and Use of Open Access Resources for Research Productivity

Level of Awareness	N	P-Value	Calculated Value
Aware that OAPs implies free access	172	.000	1
Aware of author personal websites	161	.000	.301**
Familiar with disciplinary archives	151	.001	-.262**
Aware that OAPs are in Online/electronic format	149	.003	.243**
Aware that OA are copyright free at the point of use	166	.000	.474
Usually peruse contents from OA journals, repositories	161	.000	.301**
Familiar with Open Access Initiative Metadata Harvesting Protocol (OAI-PMH)	142	.004	-.239**
Familiar with OAI	142	.004	-.239**
BioMed Central Charter on Open access	142	.004	-.239**
Familiar with Berlin Declaration on Open Access to Knowledge (BDOAK)	142	.004	-.239**
Familiar with Budapest Open Access Initiative (BOAI)	142	.004	-.239**
Familiar with Scholarly Publishing and Resource Coalition (SPARC)	142	.004	-.239**
Familiar with OAISter	142	.004	-.239**
Familiar with Public Library of Science (PloS)	142	.004	-.239**
I often use OA publications in my research	151	.001	-.262**
I usually retrieve scholarly content from OA	165	.798	.020
I have submitted many papers to open access journals	151	.428	-.065
I usually self-archive my works on the internet	160	.579	.044
I only cite and not publish in OA publications	159	.195	.103
OA is usually my first priority when sourcing for materials for my work	169	.080	-.135
OA is usually my first priority when deciding on where to publish my work	165	.097	-.130
I have some publications in open access outlets	152	.224	.099

**correlation is significant at the 0.01 level (2-tailed)
*correlation is significant at the 0.05 level (2-tailed)

Table 4.10 revealed that significant relationship was established between awareness and use of open access resources for research productivity among academic librarians in federal universities in Northwestern States of Nigeria. This position was confirmed from the details of the Table which the calculated significance of 0.000 is less than 0.05 level of tolerance, where in all the items the p-value is less than the significance level, confirming the presence of a significant relationship. Hence the null hypothesis which stated that there is no significant

relationship between awareness and use of open access resources for research productivity among academic librarians in Federal universities in North Western States of Nigeria is rejected.

Hypothesis 2: H_0 There is no significant relationship between use of open access resources and research productivity of academic librarians in Federal universities in North Western States of Nigeria.

Table 4.11: Pearson Product Moment Correlation (PPMC) Statistics to Test the Relationship between Use of Open Access Resources and Research Productivity

Usage of open access publications	N	P- Value	Calculated Value
I often use OA publications in my research	170	.000	1
I usually retrieve scholarly content from OA	166	.000	.603**
I have submitted many papers to open access journals	152	.022	.186*
I usually self-archive my works on the internet	161	.223	.096
I only cite and not publish in OA publications	157	.825	.018
OA is usually my first priority when sourcing for materials for my work	167	.000	.341**
OA is usually my first priority when deciding on where to publish my work	163	.000	.401**
I have some publications in open access outlets	150	.018	.193*
Issues like gender, age, marital status have greatly influenced my research productivity.	161	.000	.301**
Age has greatly influenced my research productivity.	161	.000	.301**
Marital status has greatly influenced my research productivity.	161	.000	.301**
Lack of enabling environment such as collegial commitment, cordial relationship have greatly influenced my research productivity	159	.000	.365**
Positive working area and good facilities have greatly influenced my research productivity	159	.000	.365**
Low level of education, skills, training, has significantly influenced my research productivity	154	.000	.412**
Lack of interest, has greatly influenced my research productivity.	159	.050	.156*
Attitude towards conducting research has greatly influenced my research productivity.	159	.050	.156*
Self- confidence has greatly influenced my research productivity.	159	.050	.156*
Low level of motivation has greatly influenced my research productivity.	154	.000	.367**
Ignorance on where to publish has greatly influenced my research productivity.	154	.000	.367**

Lack of time due to overloading teaching schedule and tenure	154	.000	.367**

**correlation is significant at the 0.01 level (2-tailed)
*correlation is significant at the 0.05 level (2-tailed)

Table 4.11 revealed that significant relationship was established between awareness and use of Open Access resources for research productivity of academic librarians in Federal universities in North Western States of Nigeria. This position was confirmed from the details of the Table which the calculated significance of 0.000 is less than 0.05 level of tolerance, where in all the items the p-value is less than the significance level, confirming the presence of a significant relationship. Hence the null hypothesis which stated: There is no significant relationship between use of Open Access resources and research productivity of academic librarians in Federal universities in North Western States of Nigeria is also rejected.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The purpose of this chapter is to present the summary of the study, findings, conclusion and recommendations.

5.2 Summary of the Study

The purpose of this study was to investigate the utilization of open access resources for academic productivity by librarians in Federal Universities in Northwestern States of Nigeria. The study tried to find out how awareness and utilization of open access resources has improved academic productivity of academic librarians, factors facilitating the use of Open Access resources, the media use in publishing their research output, factors influencing research productivity of academic librarians as well as problems bedeviling the of open access resources in federal universities in Northwestern States of Nigeria so as to recommend strategies for the enhancement of usage of this mode of scholarly communication. In order to achieve the objectives of the study, six research questions and two hypotheses were formulated and tested.

Survey research method was adopted in conducting this study. The population of the study was the academic librarians in federal universities in Northwestern States of Nigeria. A total of 200 copies of questionnaire were distributed to the respondents, 174 (87%) were duly completed and returned. Questionnaire served as an instrument used for data collection in this study.

The data collected for the study were presented and analyzed using descriptive and inferential statistics (PPMC). The findings from the descriptive analysis were presented in tables, showing frequencies of responses and their corresponding percentages, while PPMC were used to test the two hypotheses formulated for the study.

5.3 Summary of Findings

Based on the data collected and analyzed for this study, the following are the major findings:

1- The study discovered that the level of awareness is seemingly limited to knowledge about general concepts. Majority of the respondents lacked extensive awareness of specific open access initiatives such as Open Archives Metadata Harvesting Protocol (OAI-MHP), The Public Library of Science (PLoS), BioMed Central, Berlin Declaration on Open Access to Knowledge etc.

2- The findings on open access usage revealed high level of usage of open access resources, although majority claimed to have used open access resources but acknowledged that they do not make their scholarly output via same route.

3- The finding from the study revealed that facilitating factors such as support for access policy, accessibility to scholarly literature at no cost, getting informed to stay current in the field and satisfying their urge to contribute to knowledge, visibility and increased citation rate among others were considered as important or very important factors.

4- The study revealed that factors which influence low research productivity include among others lack of enabling environment, low level of education, skills and training, lack of interest, ability and attitude towards conducting research, low level of motivation, lack of time, ignorance on where to publish

5-The study discovered printed journals as the leading media used by academic librarians in publishing their research output.

6- The study discovered the factors militating against the use of open access resources were inadequate funding for building and upgrading ICT infrastructure, poor ICT infrastructure in academic and research institutions, unstable power supply, unavailability or slow of Internet connection, technological barriers arising from digital rights, lack of sensitization to adopt open,

Intellectual freedom issues such as privacy, copyright, censorship, and lack of skill on how to use ICTs facilities.

5.4 Summary of the Inferential Statistical Analysis

The result of the hypotheses tested showed that:

1- Significant relationship was established between awareness and use of Open Access resources for research productivity among academic librarians in Federal universities in Northwestern States of Nigeria.

2- Significant relationship was discovered between use of Open Access resources and research productivity of academic librarians in Federal universities in Northwestern States of Nigeria.

5.5 Conclusion

The open access movement has gained considerable recognition in the last decade. Open access is a very new and dynamic channel of access to scholarly information. The main force behind the emergence of open access is to ensure free access as against restriction to information through copyright and licensing as practiced by the business mode of scholarly publishing. Although, there is clear evidence that open access have a lot of benefit within the university set up. Unfortunately, majority of the respondent lacked extensive awareness of specific open access initiatives such as Open Archive Initiative (OAI), Open Archives Metadata Harvesting Protocol (OAI-MHP), The Public Library of Science (PLoS), BioMed Central, Berlin Declaration on Open Access to Knowledge etc., which to large extent greatly affect the level of usage of open access resources. Even though, some of the respondents claimed to have used open access resources but, majority acknowledged that they do not make their scholarly output via same route. Facilitating factors such as support for access policy, accessibility to scholarly literature at no cost, getting informed to stay current in the field and satisfying their urge to contribute to knowledge, visibility and increased citation rate among others were considered as important or very important factors that facilitate the respondents to use open access resources. In spite the fact that open access offers a lot of benefit to academic librarians

in federal universities in Nigeria, however, there are a lot of factors militating against effective utilization of open access resources which among others are; inadequate funding for building and upgrading ICT infrastructure, poor ICT infrastructure in academic and research institutions, unstable power supply, slow Internet connection, technological barriers arising from digital rights, lack of sensitization to adopt open, Intellectual freedom issues such as privacy, copyright, censorship, and lack of skill on how to use ICTs facilities. In view of the above challenges, the attractive benefits of open access cannot be achieved without considerable wrestling and reconfigurations. Advocacy on open access initiatives, supportive policies, good facilities and enabling environment have to be put into place. This would go a long way in encouraging academic librarians in federal universities in Northwestern States of Nigeria to effectively utilized open access resources and disseminate their research output via open access outlets so as to share with the international community their local content. This is only one way to make Nigeria's declining scholarly publication rate, more robust.

5.6 Recommendations

Based on the findings of this study, the following recommendations were made.

1- Efforts should be geared towards organized campaigns, advocacy on other forms of open access initiatives by inculcating understanding and awareness of the initiatives, techniques, technologies and benefits both at national and institutional level this can be achieve by organizing workshops, seminars etc.

2 -Academic librarians who use open access resources should make efforts to sensitize others to adopt the habit. The university management should provide necessary facilities and formulate policies that would encourage mandatory deposit and use of scholarly works in open access institutional repositories and other open access outlets so as to contribute to the existing body of knowledge not mere consumers.

3- Although, almost all the factors facilitating the use of open access were considered very important, librarians need to be encouraged to exploit the benefit of open access to the fullest

capacity by eradicating the difficulties that hindered effective utilization of open access resources. While measures should be taken to strengthen the facilitating condition and policies in order to improve effective use of open access resources as this would definitely add value to librarianship.

4- University management should support academic librarians by developing an intrinsic drive for knowledge creation, good research facilities that would build a positive attitude toward doing research. University management should further support academic librarians by sponsoring them for training, seminar, workshop, in the interested, innovative and emerging areas of librarianship so as to enable them to have more research skills and experience. Lastly, university should also consider the possibility of increasing a researcher's grant.

5- Through the establishment and institutionalization of open access policies that support open access and online channels for carrier development. This would go a long way in encouraging academic librarians to publish their research output through online/electronic media, discipline/subject repository and Personal/dept. homepage as this will bring closer array of information resources to their immediate users.

6- Adequate funding is seriously needed for building and upgrading poor ICT infrastructure, standby generator and inverters, Connectivity and high Internet bandwidth are equally important. Likewise, advocacy and sensitization to adopt open access is very important. Issues of Intellectual freedom such as piracy, copyright, censorship need to be addressed. Finally, adequate training on skill on how to use ICTs facilities is equally needed.

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Appendix

Department of Library and Information Science, Faculty of Education, Ahmadu Bello University, Zaria

Questionnaire on Utilization of Open Access Resources for Academic Productivity by Academic Librarians in Federal Universities in Northwestern State of Nigeria

Dear Respondent,

I am a Masters student in the above named department conducting a research entitled "Utilization of Open Access Resources for Academic Productivity by Academic Librarians in Federal Universities in Northwestern State of Nigeria." This research is essentially for academic purposes. Your library is one of those selected for this exercise. Therefore, kindly assist to respond to the questions raise in this questionnaire.

All the information given will be used strictly for research purposes only.
Thank you for your cooperation.

Yours sincerely,

Musa Aminu Umar

SECTION A: - BIO – DATA

Please kindly tick (✓) /fill the space provided

(1) Name of the University Library ……

(2) Gender: (a) Male ( ) (b) Female ( )

(3) Age: (a) 16 – 25 years ( ) (a) 26 – 35 years ( ) (c) 36 – 45 ( ) 46 years and above ( )

(4) What is your highest educational Qualification? (a) BLS ( ) (b) MLS ( ) (c) PGD ( )

(d) PhD ( ) (e) M.phil ( ) (f) Others Please specify……..

(5) How long have you been working in the University? (a) 1 -5 ( ) (b) 6-10 ( )

(c) 11 – 15 years ( ) (d) 16 – 20 years ( ) (e) 21 – 25 years ( ) (f) 26 – 30 years

(g) 31 Years and above ( )

SECTION B:- Awareness and Usage of Open Access Resources

(6) Please indicate your level of awareness of open access. Please tick the appropriate option that corresponds to your feeling about each particular question. Using scale of 1 -4 Strongly agree (SA) = 4 Agree (A) = 3 Disagree (D) = 2 Strongly disagree (SD) = 1

S/N	Awareness of Open Access	Ratings			
		SA	A	D	SD
1	Aware that OAPs implies free access				
2	Familiar with disciplinary archives				
3	Aware OAPs are in Online/ Electronic format				
4	OA are copyright free at the point of use				
5	Usually peruse contents from OA journals, repositories				
6	Familiar with initiative Open Access Initiative Metadata Harvesting Protocol (OAI-PMH)				
7	Familiar with OAI				
8	Familiar with BioMed Central Charter on Open access				
9	Familiar with Berlin Declaration on Open Access to Knowledge,				
10	Familiar with Budapest Open Access Initiative (BOAI)				
11	Familiar with Scholarly Publishing and Resource Coalition (SPARC)				
12	Familiar with OAISter				
13	Familiar with Public Library of Science (PloS)				

(7) Please indicate your level of usage of open access resources. Please tick the appropriate option that corresponds to your feeling about each particular question, using scale of 1-4 Strongly agree (SA) = 4 Agree (A) = 3 Disagree (D) = 2 strongly disagree (SD)=1

S/N	Usage of Open Access Resources	Ratings			
		SA	A	D	SA
1	I often use OA publications in my research				
2	I usually retrieve scholarly content from OA				
3	I have submitted many papers to open access journals				
4	I usually self-archive my works on the internet				
5	I only cite and not publish in OA publications				
6	OA is usually my first priority when sourcing for materials for my work				
7	OA is usually my first priority when deciding on where to publish my work				
8	I have some publications in open access outlets				

SECTION C:-Factors Facilitating the Use of Open Access by the Academic Librarians

(8) Describe the factors that facilitate your use of open access resources. Please tick the appropriate option that corresponds to your feeling about each particular question, Using scale 1 to 5 with 5= Very Important 4= Important 3= Somewhat important 2= Less Important and 1= Not Important at all.

S/N	Factors facilitating Use of Open Access	Ratings				
		5	4	3	2	1
1	Support for access policy					
2	Satisfying my need for creativity / curiosity					
3	Access to publication at no cost					
5	Getting informed to stay current in the field					
6	Achieving peer recognition and Prestige					
7	Satisfying my urge to contribute to knowledge					
8	Currency and timeliness nature of open access publications					
9	Getting respect from students					
10	Increase citation rate of your publications					
11	Limited access to subscription based publications					
12	Wider visibility of open access publications					
13	Fostering international collaboration, partnership and sharing					
14	Open access speed research progress and Knowledge sharing					
15	To improve global network and interoperability of Knowledge					

SECTION D:- Factors Influencing Research Productivity of Academic Librarians

(9) Which of the following best describes your opinions on factors influencing research productivity? Please tick the appropriate option that corresponds to your feeling about each particular question, using a scale of 1-4 Strongly Agree (SA) = 4 Agree (A) = 3 Disagree (D) = 2 Strongly Disagree (SD) =1

S/N	**Factors Influencing Research Productivity**	**Ratings**			
		SA	A	D	SD
1	Gender, have greatly influenced my research productivity.				
2	Age, has greatly my research productivity.				
3	Marital status has greatly my research productivity.				
4	Lack of enabling environment such as collegial commitment, cordial relationship have greatly influenced my research				
5	Positive working area and good facilities has greatly influenced my research productivity				
6	Low level of education, skills and training,				
7	Lack of interest has greatly influenced my research productivity.				
8	Attitude towards conducting research has greatly influenced my research productivity.				
9	self- confidence, significantly influenced my research productivity				
10	Low level of motivation has greatly my research productivity.				
11	Ignorance on where to publish, greatly my research productivity.				
12	Lack of time due overloading teaching schedule and tenure influenced has greatly my research productivity.				

SECTION E: -Publishing Media Used by Academic Librarians in Publishing their Research Output

(10) Please indicate the types of media used by academic librarians in publishing their research output by ticking as appropriate.

SN	Media Used in Publishing Research Output	Tick (✓)
1	Print Journals	
2	Electronic Journals	
3	Open Access Repositories	
4	Fee based Journals	
5	Discipline/ subject repository	
6	Personal/ dept. homepage	
7	Open Access Journals	
8	Textbook	
9	Conference proceedings	
10	Scientific Peer-review bulletin	
11	Seminar paper	
12	Occasional paper	
13	Thesis/dissertation	

(11) If you have published, on which criteria do you base your choice of journal, when submitting an article? Please tick as appropriate

(a) Prestige – it is on a shortlist of approved journals (Promotion, funding) ( )

(b) Timeliness – short time from submission to publication ( )

(c) Availability – articles are available for free on the Web ( )

(d) Retrieval – journal is indexed in a free Web database ( )

(e) Citation – the resources will be read by more people and probably cited more ( )

(f) Benefit – Open Access benefit boosts developing countries access to scholarly outfit ( )

(e) Other (Please specify) …….

SECTION F: - Factors Militating Against the Use of Open Access

(12) Please indicate the factors militating against your usage of open access resources. Please tick the appropriate options that correspond to your feeling about each particular question, Using a scale of 1-4 Strongly agree (SA) = 1 Agree (A) = 2 Disagree (D) = 3 Strongly disagree (SD) = 4

S/N	Factors Militating Against the Use of Open Access	Ratings			
		SA	A	D	SD
1	Low level of awareness				
2	Lack of adequate funding for building and upgrading ICT infrastructure				
3	Poor ICT infrastructure in academic and research institutions				
4	Unstable power supply				
5	Unavailability Internet connection				
6	Slow Internet connection				
7	Technological barriers arise from digital rights				
8	Lack of sensitization to adopt open access				
9	Inadequate advocacy for open access in Nigeria				
10	Intellectual freedom issues such as privacy, copyright, censorship,				
11	Lack of Skill on how to use ICTs facilities				

Thank you for taking your time to complete this questionnaire.