Full Length Research

Open Access Institutional Repositories in Academic and Research Institutions in Nigeria: A Review of Benefits and Challenges

[1]Victor Chuks Nwokedi (*Ph.D., FIASR, CLN*) & [2]Grace Iyabo Nwokedi (B.Sc., MLIS)
[1]Faculty of Education, Department of Social Science Education, Library and Information Science Unit, University of Jos.
E-mail: victorchuksnwokedi@yahoo.com (Corresponding author)
[2] University of Jos Library, P.M.B. 2084, Jos, Nigeria.

Institutional Repositories offer the opportunity for academic libraries to collect, preserve and disseminate an institution's scholarly output. Serving an important service to the community, Institutional Repositories offer many benefits to the academic institutions community as well as other people and communities around the world. Institutional Repositories make it possible to collect content in one location, capture and provide open access to the intellectual output of a university, as well as preserve content that may be otherwise unavailable or out of publication. It is essential to explore the benefits as well as the challenges of Institutional Repositories to make sure it is worthwhile to the library as well as the institution. This paper therefore, explores benefits and challenges faced in the introduction and sustainability of Institutional Repositories in academic institutions in Nigeria. Lastly, it was recommended that National Universities Commission (NUC) should organize series of conferences and capacity building workshops to educate and train stakeholders in academic and research institutions in Nigeria on the benefits of establishing Institutional Repository. In this way their knowledge of Open Access Institutional Repository will be enriched and they will be in a better position to advocate for change in policies within their institution and at national level. This will create a conducive environment that will nurture the development and growth of open access Institution Repository in Nigeria.

Keywords: Open Access, Institutional Repository, Benefits and Challenges, Nigeria

INTRODUCTION

Open access Institutional Repository is fast becoming one of the best avenues utilized by institutions in making their research knowledge or output widely available and accessible to the outside world via the World Wide Web. Steele (2013) presents a working definition of Open Access Institutional Repository as "a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end users both within and outside of the institution, with few if any barriers to access". The growth of open access Institutional Repositories has been very remarkable in developed countries as well as some developing

countries like Brazil, India and South Africa. However, notwithstanding the large number of academic and research institutions in Nigeria, as at the time of this writing, there appeared to be few functional Open Access Institutional Repositories in the country (Anene, Alegbeleye, & Oyewole, 2017). The resulting effect is that the volumes of research output emanating from the country - most of which address local and regional developmental issues continue to reside in obscurity – not visible to those who may need them (Oguche, 2016).

This paper therefore, examine ways through which problems associated with the poor visibility and access to research output from academic and research institutions in Nigeria could be addressed by means of Open Access Institutional Repositories.   Therefore, the aims of this review paper are to examine the:

1. State of scholarly publishing in Nigeria;
2. Benefits of Open Access Institutional Repositories;
3. Challenges faced in the introduction and sustainability of Open Access Institutional Repositories in Academic and Research Institutions in Nigeria; and
4. Prospects of Open Access Institutional Repository

Overview of open access institutional repository

The Open Access (OA) which is an off-shoot of a wider global movement called access to knowledge is a vital component of scholarly communication. Open Access (OA) focuses on the need to provide free, immediate, online and unrestricted access to peer-reviewed literature. This can be achieved via the Green or Gold paths. Koler-Povh, Mikoš & Turk (2014), put it succinctly that there are two basic principles established in the world that provide to the public free OA to scientific publications, frequently called gold path and green path of OA. With the gold path of OA, the public is given free access to publications at a publisher's website. With the green path of OA, the public has OA to available publications kept in repositories or storages and findable with customary Web search engines. Ramasamy & Padma (2015) expressed the Budapest position on how to achieve OA goals better by stating that there are two primary means for achieving OA goals, namely, Gold OA or "author pays", achieved by publishing in a peer-reviewed, scholarly OA journal in which articles are freely available online, and "Green" OA or "self-archiving", achieved by publishing in any peer-reviewed journal and then depositing a peer-reviewed version or preprint of the article in an OA repository.

State of Scholarly Publishing in Nigeria

Academic institutions at the tertiary level are the focal point of scholarly and applied research in Nigeria. In terms of scholarly research, university-based research entered the scene with the establishment of the University of Nigeria in 1948 – the first premier university in Nigeria. With the passage of time, the number has grown to 154 (as at the time of writing) federal, state and private universities. The Federal Universities have been classified into three generations (National Universities Commission, Annual Report for 2017). The first generation universities are University of Ibadan, University of Lagos, University of Nigeria, Ahmadu Bello University, Obafemi Awolowo University and University of Benin. The second generation class is composed of University of Ilorin, University of Jos, University of Maiduguri, University of Calabar, Usman Danfodio University and Bayaro University. The third generation is composed of specialized universities of technologies and agriculture situated in Abeokuta, Akure, Bauchi, Makurdi, Minna, Owerri, Yola and Umudike.

The Federal Universities receive a large proportion of their grant from the Federal Government. In addition, they (especially the first generation) account for a significant proportion of the scholarly research conducted in Nigeria. As a matter of fact, close to 50% of the staff/students in Nigerian universities are teaching/enrolled in the first generation universities (Ezema & Ugwu, 2013). Although research at Nigerian universities occurs in all the major branches of science, a survey carried out by Ezema & Ugwu (2013) suggests that Nigerian scientists have made much contribution in the fields of applied science. The survey which focused on the six first-generation universities in Nigeria shows that research in agriculture was predominant (33%). Much of the research in agriculture focused on increasing food production through higher yields (Ezema & Ugwu, 2013). Research in Engineering and Medicine ranked second and third respectively.

Other areas of research in Nigerian universities identified by the survey are in the physical and mathematical sciences. Research in mineralogical exploration pursued at three of the first generation universities led to the discovery of economic mineral deposits. Apart from tangential incursion into applied research, especially in analytical chemistry, the study further suggests that most of the chemical research at Nigerian universities tend towards solving fundamental, internationally recognized problems (Ezema & Ugwu, 2013). Most of the scientists in Nigerian universities work alone on their projects though sometimes they are assisted by graduate students. Collaborative research is often rare. Though few cases emerge from "accidental convergence of individual lines of research rather than as a result of a planned attack on a major scientific problem" (Finlay, Tsou, & Sugimoto, 2015). Even in exceptional cases where collaborative research emerge, they hardly stay on for a long while due mainly to high mobility of

local academics who want to set up and lead their own groups (Eke, 2011).

The state of research publishing in local academic journals in Nigeria has been on the rise in recent times. Unfortunately, most of these publications are not openly accessible (Ridwan, 2015). A recent trend in an attempt to make such publications widely accessible has been to list the journals in the African Journal Online database (www.ajol.info). According to Oguche (2016) most academics in Nigeria, publish their works because of the following reasons: to gain financial reward, to gain personal prestige, to communicate their results with colleagues, and to advance in their career. However, the most important reason academics publish all over the world including Nigeria, is for the purpose of advancing their career (promotion). This is not surprising, because promotion in the academic environment is tied to academic publications (Oguche, 2016). Hence, most academics in Nigeria are more concerned with having their article published and less concerned as to the visibility of the medium of publication they have adopted (Kunle, 2015). This notion has resulted in the proliferation of academic journals published by departments or faculties within the academic institutions. These journals have very low circulation hence making it even more difficult to measure up to international standard. They seem to be set up for the purpose of enabling 'colleagues' to have their papers published so that they can have some 'published works' to table before academic promotion committees (Oguche, 2016). The result of this academic culture was vividly described by Egwunyenga (2010). Many journals sprout in departments and faculties in universities, some of which did not go beyond the first volume before they ceased to exist either because of poor subscription, funding, internal contradictions or having realized their immediate objectives of presentation for promotion (Egwunyenga, 2010).

Benefits of Open Access Institutional Repositories

Chang & Aeernoudts (2015) postulated that reasons for setting up repositories vary, and a range of projected benefits have been suggested in many literatures. These include benefits to the researcher, to the institution, and to individual disciplines. Academic libraries also benefit from being involved in Institutional Repository Initiatives, and there are implications for scholarly communication overall. The primary reasons used to persuade academics of the benefits of placing their output in an Institutional Repository is exposure—that by having their research and publications openly available on the Web, not just in fee-based databases, scholarly journals, or books, their work is likely to be used and cited more (Kule, 2015). As a result, their reputation will be enhanced over the long term, due to the recognition they gain from this (Xia, Gilchrist, Smith, Kingery, Radecki, Wilhelm & Harrison, 2012). Other benefits to researchers include stewardship and preservation of their publications in digital form, which frees them from the need to maintain this content on a personal computer or website (Akintude, 2010).

Many benefits are identified, at the institutional level, or even at the national level. In Japan, for example, the Ministry of Education, Culture, Sports, Science and Technology have encouraged Japanese university libraries to develop institutional repositories to promote sharing of knowledge throughout Japan and internationally (Xia & Opperman, 2012).

The development of Institutional Repositories in Nigeria is seen as a way of making institutional research outputs available to a community with less than optimal access to resources (Ogbomo, & Muokebe, 2015). Akintunde (2010) observed that in Nigeria Digitization holds the advantage of providing a platform for sharability and duplicity of data, and networking because of the digital form of content. It also enhances the life-span of records as well as securing data and records that would have been obliterated due to their age.

It is now obvious to the academic and scholarly community that the traditional model of scholarly communication via subscription-based journals, serves to hinder rather than expand access to research output (Mohammed, 2013). In the light of emerging trends in digital scholarly communication, open access Institutional Repositories play an important role in the preservation and dissemination of institutional research outputs which in turn becomes a constituent part of a global research output. Although publications by faculty members in scholarly journals could add impact to the prestige of the institutions they are associated with, an Institutional Repository stands to generate greater impact by centralizing research outputs generated by the institution's researchers, and thus serving as a much better and simpler metrics for gauging the quality of the institution's academic scholarship, productivity and prestige (Musa, Musa & Aliyu, 2014). In the case of research and academic institutions in Nigeria, development of Institutional Repository will not only boost the global visibility and utility of their research, but will also introduce a novel research culture focused on meeting international standard and values. Knowledge by a researcher that his/her research will be openly accessible by a global audience will have an impact on his/her focus and standard. Anbu (2010) was of the view that the current closed access publishing model fails to portray the quality and quantity of research done in African universities and by African scholars.

Bonn (2014) also identified justifications for Institutional Repository to include increase in visibility and impact of research output, change in the scholarly

publication paradigm and improvement of internal communication within the institution. A study by Steele (2013) revealed that an institutional repository could have a positive impact on the visibility and accessibility to an institution's intellectual output. The study was based on the School of Business of the University of Otago in New Zealand. The School was the first to develop a publicly accessible institutional repository which went into operation in mid-November 2005. By the end of January 2006, there was a record of 9000 downloads from 60 different countries. Over two months later, the number of downloads doubled and included visits from eighty countries. The statistics further showed a total of 18,744 download from 80 distinct countries since the repository went live. Growth had been consistent over the entire period. The most popular paper (an Information Science discussion paper) had 451 downloads from 23 countries after twelve weeks in the repository. The top ten downloaded papers included two discussion papers, two working papers, two technical reports and four Honours dissertations (one of which was manually scanned from the original hard copy). Of these, only the discussion papers were previously available online, so the advent of the repository has had a clear impact on the availability of research within the School of Business (Czerniewicz, 2013).

Czerniewicz (2013) has argued that Institutional Repositories provide a compelling response to two strategic issues facing academic institutions. First, it expands access to research, reasserts control over scholarship by the academy, increases competition and reduces the monopoly power of journals, and brings economic relief and heightened relevance to the institutions and libraries that support them. Secondly, it serves as a tangible indicator of a university's quality and to demonstrate the scientific, societal, and economic relevance of its research activities, thus increasing the institution's visibility, status, and public value. Czerniewicz (2013) further stated that, Institutional Repository could also be seen from two complementary perspectives. First as a natural extension of academic institutions' responsibility as generators of primary research seeking to preserve and leverage their constituents' intellectual assets; and secondly as one potentially major component in the evolving structure of scholarly communication.

Institutional Repositories provide access to wealth of scientific and technological information and knowledge which are very essential for development. The opportunities presented by Institutional Repositories and Open Access archives to the development of Africa as well as the challenges hindering the development of digital information repositories on the continent has been examined by Ridwan (2015). The researcher acknowledged the fact that several of the research output from the region exists in the form of grey literature i.e.

unpublished information and knowledge resources such as research reports, theses and dissertations, seminar and conference papers. Very little research outputs find their way into the world's well-established international scientific journals, due to various problems among them because publication in mainstream journals faces the problems of over-subscription and recorded prejudice against submissions from developing country scientists. Additionally, local journals in general have poor distribution and visibility. This situation results in research from Nigeria not being indexed in major international databases which have the capacity to increase the visibility of these research outputs. He further noted that much of the research generated in research institutions are not being shared or developed further beyond field and laboratory research. Very useful and valuable technological and scientific information and knowledge remains unexploited and in some cases is lost (Ridwan, 2015).

The establishment of Institutional Repositories in academic and research institutions in Nigeria is a serious developmental issue that requires urgent attention. As Ridwan (2015) rightly observed, they are valuable for research and development because they can offer instant access to information and knowledge resources being generated on the continent. The universities and research institutions in Nigeria are the major centres of research and consequently the major generators of research based data, information and knowledge. The scientific and technological information and knowledge which they are generating should be easily accessible, and the creation and use of Institutional Repositories could be the first step in this process. The importance of Institutional Repository in collaborative production and dissemination of scholarly information have been evidenced by concerted efforts geared towards assisting academic and research institutions in developing open access institutional repositories.

There is now a growing call for academic and research institutions in Nigeria to establish Institutional Repositories where their scholars and researchers are required or mandated to deposit or archive their research output (Ridwan, 2015). Oguche (2016) summarizes the benefits a library stands to gain from an Institutional Repository:

1. opening up outputs of the institution to a worldwide audience;
2. maximizing the visibility and impact of these outputs as a result;
3. showcasing the institution to interested constituencies –prospective staff, prospective students and other stakeholders;
4. collecting and curating digital output;
5. managing and measuring research and teaching activities;

providing a workspace for work-in-progress, and for collaborative or large-scale projects;

6. enabling and encouraging interdisciplinary approaches to research;

7. facilitating the development and sharing of digital teaching materials and aids; and

8. supporting student endeavors, providing access to theses and dissertations and a location for the development of e-portfolios.

In addition, Institutional Repositories can help libraries to reduce the costs in purchasing academic articles and journals because they can get these articles and journals from another institution's Institutional Repositories (Nykanen, 2011). All of these benefits involve digital curation because they span the information life cycle and involve achieving goals that are central to digital curation, such as "interoperability with the future" and "communication across time" (Bonn, 2014). From a different perspective, Anene et al, (2017) noted that IRs have the potential to increase the visibility and provide a better picture of Nigeria's scientific and technological research outputs and specialization; increase the accessibility and impact of research both in Nigeria and at the global level; and preserve and maintain the research outputs of Nigeria's universities and research institutes.

Challenges Faced in the Development of Open Access Institutional Repositories in Academic and Research Institutions in Nigeria

The emergence of Open Access Initiatives as well as Information and Communication Technologies (ICTs) provides a veritable medium to address the problem of poor visibility of academic research information emanating from Nigeria. The shift from the conventional print publication to the use of digital sources and internet media have provided academic and research institutions in Nigeria with an opportunity to make their grey literature and research output accessible to the outside world (Mohammed, 2013). However, it may be surprising to observe that academic and research institution in Nigeria, are yet to take advantage of the benefits provided by open access institutional repositories (Bashiru, 2010). Some of the issues identified by existing literatures as being responsible for the slow uptake of Institutional Repositories in Nigeria include lack of knowledge or awareness of Open Access Institutional Repository, poor state of Information and Communication Technology, inadequate advocacy for Open Access Repositories, poor or inadequate funding, copyright and intellectual property rights (Bashiru, 2010).

1. Unawareness of open access publishing

Many authors have highlighted on the low level of awareness of open access publishing in Nigeria. According to the findings of Ogbomo & Muokebe (2015), 42.6% of academics in University of Lagos (Nigeria), 'strongly agree' that lack of knowledge or awareness of open access institutional repository is an obstacle to the development of institutional repository in their institution. This is in addition to 26.4% who 'agree' (as opposed to 'strongly agree') to the same. Ogbomo & Muokebe (2015), sought to determine the level of awareness of open access institutional repository among his respondents. Without first giving a definition or explanation of an open access institutional repository, the respondents were asked to state their level of familiarity with the term "Open Access Institutional Repository/Archive" with reference to scholarly research. Of the 66 valid response to this question, only 2 (3%) of the respondents were very familiar with the concept of open access Institutional Repository, 15 (22.7%) know very little about the concept and a great majority of the respondents precisely 49 representing 74.3% were completely unfamiliar or know nothing about Open Access Institutional Repository. The questionnaire then went on to define and describe open access Institutional Repository. With this additional information, the respondents were asked to indicate the level of importance of institutional repository to their institution. A total of 55 (78.4%) agreed that the development of Institutional Repository is "very important" for their institution. Ten respondents representing 13.9% of the total response agreed that it is "important", 5 (6.9%) respondents were neutral. None of the respondents sees Institutional Repository as being "unimportant" to their institution. Lack of knowledge or awareness of open access Institutional Repository is not peculiar to the respondents at the University of Lagos. In fact this is the situation in most developing country institutions (Bonn, 2014). Ignorance or lack of knowledge of open access institutional repository seems to be one major issue to the development of Open Access Institutional Repository in Nigeria. It is only when this ignorance is tackled that any meaningful progress can be made.

2. Inadequate ICT connectivity and infrastructure

The development of open access institutional repositories requires fast and reliable internet connection as well as deployment of adequate information and communication technology infrastructure. The major point of internet access to students and staff at Nigerian universities is through internet cafés (Kunle, 2015). A study of internet usage in Nigerian universities by Kunle (2015) shows that 45.2 percent of the respondents access the internet through internet cafés. The situation

is not too different at most Universities in Nigeria. The cafés are usually operated by private entrepreneurs on facilities or buildings leased from the University. The average cost for using the internet facility at the café is about $1 for an hour. Although this may appear cheap, the connectivity is so slow that it may take about 15minutes to access a yahoo mail account. The café are usually fraught with too many restrictions such as prohibition of the use of external storage devices like flash drives. Hence, since users cannot download materials from the internet into any external drive, they only have the choice of paying to print the materials. This thus makes the café only useful for checking and replying to emails as opposed to research.

This problem is further compounded by the slow speed of internet connectivity. Notwithstanding the growth in internet usage in Nigeria, the speed and reliability of the internet connections still posses a great deal of challenge to most of the institutions in Nigeria. Low internet bandwidth availability in the sub-Saharan African region posses an obstacle to the deployment of institutional repository. It has been observed that institutional repositories require reliable and fast internet connection since the common mode of availability of materials are in the form of Portable Document Format files (PDF Files) (Kunle, 2015). The high cost of internet bandwidth in Nigeria makes it much difficult for academic institutions in Nigeria to afford adequate bandwidth to host digital repositories (Musakali & Moli, 2011). It has been observed that bandwidth allocation in Africa is so expensive that most universities (on their own budget) cannot afford more than 1.544 Mbps which is less than many home broadband users in North America (Musakali & Moli, 2011). African universities pay about $10,000 a month for same internet bandwidth that will cost a consumer in Europe and North America less $100 a month (Moxley, 2013).The problem was well described by Moxley (2013) who claimed that Bandwidth is the life-blood of the world's knowledge economy, but it is scarcest where it is most needed – in the developing nations of Africa which require low cost communications to accelerate their socio economic development. Few schools, libraries, universities and research centres on the continent have any internet access. For those that can afford it, their costs are usually thousands of times higher than for their counterparts in the developed world, and even Africa's most well-endowed centres of excellence have less bandwidth than a home broadband user in North America or Europe, and it must be shared amongst hundreds or even thousands of users (Moxley, 2013).

In 2013, the International Network for the Availability of Scientific Publications (INASP) commissioned a report which compared internet connectivity and cost in selected African universities with a British university. It was observed that several African universities in the study

have an internet connection of between 512 Kbps and 1Mbps (as at May 2013). The British University (Bristol) by contrast has a 2.5 Gbps link. This is 5120 times as much as the University of Dar es Salaam, (Tanzania) has. The report further notes that whereas University of Dares Salaam has 2000 computers shared by 11000 users (i.e. an average of 5.5 person per computer), Bristol has 16,000 computers shared by 22,000 users (i.e. an average of 1.3 person per computer) (The Global Information Technology Report, 2016). One of the major factors responsible for the high cost of internet bandwidth in Africa is the use of satellite bandwidth as opposed to much cheaper optic fibre infrastructure (Seaman, 2011).

Hence, as Bonn (2014) rightly observed, unless interventions are made to reduce the cost of existing international fibre links as well as to quickly develop new fibre infrastructures, the continent will be prevented from tapping its latent potential and this will further widen the digital divide.

Another infrastructural problem associated with internet connectivity in Nigerian academic institutions is the problem of electricity power supply (Eke, 2011). An Institutional Repository should be openly accessible 24 hours a day. This will thus imply a sustained and regular electricity supply to power ICT facilities. Electricity supply is one of the major problems in Nigeria. This problem has made the development of projects like an institutional repository in Nigeria much difficult and expensive. Akintunde (2010) has observed that poor electricity supply is a major impediment to the operation and growth of information and communication technology in Nigerian universities. According to him, only a trickle of daily electricity production dribbles erratically into the country's 154 institutions, rendering ICT systems dysfunctional. Universities resort to diesel-propelled generators, but they are expensive and environmentally unfriendly.

Nigeria produces about 2,500 megawatts a day of electricity – ten times less than its daily need. The extent to which this problem affects ICT projects in the Nigerian educational sector is self-evident. For example, in 2001 the National Universities Commission (NUC) in Nigeria commenced development of the virtual library project. The need for the project was to create a central digital repository that will assist the Nigerian university system in terms of acquisition of electronic resources to supplement the resources available in the individual university libraries. In order to deal with the problem of constant shortage of electricity power supply, the server for the project had to be located in far away United Kingdom thus resulting in much higher cost of operation. Another institution that has had to deal with this problem in its effort to develop an Institutional Repository is the International Institute of Tropical Agriculture (IITA). The Institution which is at the final stage of developing an Open Access Institutional Repository also had to locate its server in the United Kingdom due mainly to the

incessant problem of power supply in Nigeria.

Various researches have also confirmed that many institutions in developing countries face an unreliable electricity supply, poor Internet connections, as well as lack of adequate computer equipment, appropriate software, and even technological expertise (Akintunde, 2010).

3. Inadequate Funding

Lack of funding is another major problem experienced by developing country institutions in their effort to establish digital repositories. As has been stated earlier, the state of ICT infrastructure in academic and research institutions in Nigeria is so low to sustain the development of institutional repositories. Hence, a viable digital repository project will first require serious upgrading of the current state of ICT facilities in many academic and research institutions in Nigeria.

Development of institutional repository in developing countries is much a capital intensive project than in developed countries. This is because academic and research institutions in developed countries already have in place a well-established state-of-the-art ICT infrastructure to build on. But in Nigeria, this infrastructure or foundation is not in place and will require huge financial resources to put them in place (Oguche, 2016)

Additionally, the high cost of internet bandwidth in developing countries (previously discussed) further worsens the problem. It is rather curious that Nigeria institutions with far limited financial resources (as compared to their counterparts in developed countries) eventually end up paying more for same bandwidth than their counterpart in developed countries (Bashiru, 2010). These factors contribute to inflate the cost of establishing digital repositories in Nigeria. Most of the universities in Nigeria receive substantial part of their funding from the government's budgetary allocation. This increase in cost of developing digital repositories is even made worse by the fact that the institutions in Nigeria continue to grapple with declining funding from budgetary allocations from the governments (Musa et al, 2014).

A typical cost for developing an institutional repository in Nigeria will cover the cost for a server, subscription for adequate bandwidth, cost for building an alternative energy source, computer staff time for running and maintaining the ICT facilities, costs of purchasing scanning equipment, library staff time in formatting documents etc.

4. Inadequate advocacy

One of the best ways to promote the development of open access institutional repository in Nigeria is through advocacy. For such an advocacy to be really effective, it must be undertaken by the stakeholders in the country.

These stakeholders include lecturers, researchers, librarians as well as students. Effective advocacy presupposes that the advocates or stakeholders are very familiar with the concept. Unfortunately, the knowledge of open access institutional repository is very low among the major stakeholders in the country (Kunle, 2015). Hence, there is need for increased advocacy of open access institutional repository in the developing countries like Nigeria. Advocacy could be undertaken through national and regional workshops and conferences as well as training of stakeholders within the region.

5. Inadequate Skilled Manpower

Ezeani & Ezema (2011) from their findings reported that, the most nagging problem in the digitization project is attracting the required skills for troubleshooting of equipment such as computer systems, scanners among others. Akintunde (2010) while reporting the problem bedeviling the project at the University of Jos stated that lack of skilled personnel to manage the repository was one of their major challenges.

6. Non-Cooperation from academic community

Akintunde (2010) observed lack of Support from the university of Jos academic community, in terms of usage and uploading of content. They stated that the response from the academic community did not meet with their expectations, even after several rounds of sensitization. However, it was evident that more responses have been received after each sensitization programme. So, the library will have to keep going after the user community and content providers.

7. Intellectual property rights / publishing agreements

Another issue that may affect the development of Institutional Repository is intellectual property. Intellectual property right is an aspect of law that covers diverse legal rights that exists in creative work. Intellectual property law embraces such exclusive rights in copyright, patent, trademark, industrial designs, trade secret, trade name, etc. Copyright law determines how a person can deal with a written work such as a journal article or a research paper. Generally, a copyright holder has the exclusive right to authorize the copying, recopying or distribution of the written work. In other words, he has the right to determine whether the work shall be available in a closed or open access format (Oguche, 2016).

i. What is copyright?

Copyright is a collection of legal rights that is attached to an original work when it is created (Charbonneau & McGlone, 2013). Copyright law is an aspect of intellectual

property law that seeks to invest authors with monopoly right or control over their creative work including the right of exploitation to their work as well as the right to "ensure that their work is properly credited and is not changed in a way that harms the author's reputation" (Ridwan, 2015). Copyright protects expressions and not ideas. Hence a work will qualify for copyright protection if it passes the test of originality. Originality does not mean that the work must be novel as in the case of patent, rather the work must originate from the author in the sense that the author must have invested some minimal intellectual effort as opposed to mere copying.

Subject matters which fall within the domain of copyright law include literary work, artistic work, dramatic and musical works. Literary work covers written or printed expressions irrespective of the form in which they exist whether in paper or electronic format. Research articles or papers and written materials in digital repositories clearly fall within the domain of literary work. Although for now, bulk of the contents in many open access digital repositories and electronic journals consists of literally works in the form of written materials, Ridwan (2015) has observed that increasingly in the future, other kinds of materials will be contained in digital repositories and published in electronic journals. Such materials may include images, diagrams and graphs. This ordinarily should fall within the classification of artistic works. However, in discussing copyright as it relates to open access institutional repositories, this paper will focus on literally works.

ii. Ownership and assignment of copyright

Generally, copyright in a work is originally conferred on the author of the work. This is referred to as the first ownership of copyright. There is however an exception to this general rule. One of such exception relates to a situation where the literary work is produced by the author under a contract of service of apprenticeship or under a contract of employment which expressly vest copyright in the work on some person or institution other than the author. For example, copyright in a research paper produced by a researcher in the course of his employment in a research institution or a university will normally vest in the author in the absence of any express agreement to the contrary. Where the literally work is the product of the combined effort of more than one author e.g. a team, copyright in the work will vest jointly in the authors unless the authors have contributed various and distinct part of the work in which case each will retain the copyright in relation to his/her distinct part of the work. Copyright, although intangible is recognized in law as a property and hence capable of transferability. This could be done in any of the following two ways.

a.   Assignment of copyright:

Ownership right in copyright could be transferred by assignment. Assignment of copyright is the process whereby a copyright holder in a work (assignor) completely divests himself of all rights as it relates to the work by transferring the same to some other legal person (assignee). When copyright in a work is assigned, the original owner henceforth is in the same position as any other person in relation to the work. He cannot exercise any right or use the work except with the consent of the assignee. Otherwise the original owner will be liable for copyright infringement unless the act comes under a statutory exception to infringement. This principle applies in every case where for example, an author of a research paper submits same for publication in a journal and is required to assign the copyright in the work to the journal publisher(s). This is one area where researchers and academics need to be especially cautious to understand the full legal implication of what they are doing.

b. Licensing of copyright

Licensing is a means by which an author may authorize some other person (including a publisher) to exercise one or more of his excusive right to a literary work without divesting himself / herself of all his rights in the work as in the case of assignment. A license is a consent or permission to use intellectual property on the terms specified by the licensor who remains the owner (Kim, 2010). The author still retains all rights to the literary work subject only to the rights granted or licensed. Unlike assignment, a license need not be written; it could even be implied from conduct. Hence by merely submitting a research paper to a journal for publication, the author impliedly grants the journal the right or license to publish the work. A license can be exclusive or non-exclusive. An exclusive license grants the licensee the exclusive right to a particular act in relation to the copyright. The right is exclusive because no other person, not even the author, can exercise the right for the duration in which it is granted. A non-exclusive license grants to the licensee the permission to exercise the relevant right while at the same time permitting the author to grant the same right to some other person and to continue to exercise the right himself.

Challenges facing Nigeria Institutions that have Established Institutional Repository

Although Institutional Repository are relatively quick and expensive open access software, there should be proper Infrastructure, such as software, hardware, staff who should be properly trained and proper rules and guidelines to maintain the various policies and to manage the system. According to Musa et al (2014) the

implications and potential barriers to existing IRs in Nigeria institutions are summarized below:

a. **Difficulties in Generating Content:** A successful Institutional Repository depends on the willingness of authors to deposit their works voluntarily and there may be local barriers and hindrances to overcome the. There are acknowledged difficulties in generating content, especially at the beginning. Unless the value of an Institutional Repository can be demonstrated quickly, the organizations long-term commitment to the project may began to wane. The best way to prove the enduring value of the IR and to ensure its long- term survival is to quickly populate it (Anene, et al, 2017).

b. **Right to Management Issues:** Sometimes researchers are apprehensive about infinfringing publishers copyright and lack adequate awareness about their own intellectual property rights. They may be uncertain about making their work available online before it is published by a traditional publisher.

c. **Working Culture Issues:** Contributing content to user- generated or ''self-service" sites is time consuming and time is something which academics often lack. They may be willing to contribute content but reluctant to do it themselves. This calls for mediated deposits service for them.

d. **Policy Issues:** Experiences suggest that an Institutional Repository will only function to its capacity when a mandate is in place to populate it but clearly researchers can react negatively to any suggestion of compulsion. Seaman (2011) has cautioned that an Institutional Repository should not become a tool for enforcing administrative control over academic work.

e. **Lack of Incentives:** In the absence of any incentive academics feel reluctant to provide even bibliographic details of their scholarly output especially when they know that incentives are available in other institutions.

f. **Cost:** Initial financial cost for an open source software adopted by most institutions for creating Institutional Repositories is not high but the recurrent costs, especially staff costs (i.e time spent drafting policies , developing guidelines, publicizing, training, supporting users and creating metadata, specialists IT consultancy) may be significant.

Prospects of Institutional Repository to the Host Library

Digitization improves access to library resources.

Providing access to digitized collections can help publicize the materials to other departments and peers, in other institutions around the world and demonstrate the importance of the collections. The digitization of priceless and valuable collections of the institution brings prestige to the whole institution as it creates visibility not only of the library's (institutions) content, but the scholars work within the university in Nigeria. Akintunde (2010) stated that digitization holds great promise for preservation of materials, sharability of resources, and visibility of Nigerian libraries and institutions. The increase in Nigerian content on the Web will enable more meaningful and fruitful researches to be conducted through access to relevant data and literature. Nigerian libraries will also be able to communicate more professionally with colleagues in other parts of the globe. The choice and deployment of appropriate software will particularly bring contents together and provide a common platform for the exchange of knowledge in today's knowledge society. According to Bashiru (2010) today, —the global village is being described on the basis of ICT as information rich northern hemisphere and information poor southern hemisphere of which Nigeria is one. A major characteristic of an information poor society is Low-level ICT with minimum local content on the web for local and global consumptionǁ. Nigeria can only be part of this global movement by using ICT to bridge the gap and cross over.

CONCLUSION

In the course of discussion, the paper has established the need for Open Access Institutional Repositories in academic and research institutions in Nigeria. Institutional repositories in the 21st Century can revitalize the libraries as information providers, but only if Issues of lack of awareness, inadequate ICT connectivity and infrastructure for implementation, inadequate funding, inadequate advocacy, intellectual property rights, insufficient technological skills epileptic power supply, copyright and licensing can be critically addressed to allow a wide range of libraries to adopt the concept. The researchers believed that if these issues raised are tackled, the problems associated with the poor visibility and access to research output from academic and research institutions in Nigeria will be fully addressed.

RECOMMENDATIONS

The following recommendations are proffered: With regards to the issue of awareness and advocacy, it is highly recommended that the approach adopted in eIFL and SASLI in South Africa be applied also in Nigeria - namely: organizing series of conferences and capacity

building workshops to educate and train stakeholders in academic and research institutions in Nigeria. In this way their knowledge of open access will be enriched and they will be in a better position to advocate for change in policies within their institution and at national level. This will create a conducive environment that will nurture the development and growth of open access in Nigeria. Considering the size of the country and number of educational institutions in the country, it suffices to add though the level of resources required here will be more than what was committed in South Africa.

The two major issues in ICT relates to internet bandwidth and electricity supply to power ICT infrastructure. With regards to the first, the short term solution will be to support initiatives such as the Bandwidth Consortium (BWC) aimed subsidizing the cost of internet bandwidth in academic and research institutions in Nigeria. The long-term solution in this area should take the form of increased backing for international optic fibre infrastructure as well as an open access policy to the project so as to provide equal access to all bandwidth providers. To deal with the issue of electricity supply to power ICT infrastructure, there is need to fund research into development and implementation of efficient power generating alternatives to power ICT facilities used in the deployment of institutional repositories.

It was also observed that the development of institutional repository in Nigeria is a capital intensive project. This issue is worsened by the diminution of budgetary allocation from government to the educational sector. There is need for increased funding from international donor agencies to help academic and research institutions in Nigeria to uplift the state of their ICT infrastructure. Other alternative sources of funding that could be researched into includes corporate entities like telecommunication companies operating in the country.

The academics, lecturers and researchers should be motivated to make contents available for upload in the repository as contents constitute a major building block of Institutional Repository.

As regards copyright issues, it is highly recommended that authors within the region should be educated on their rights in relation to their intellectual output. This is very important as these authors continue to sign away their legal right without knowledge of the legal implication of their act. If this problem is not tackled at the moment, their institutions will encounter another difficult problem in filling their repositories should they succeed in developing one sometime in the future.

The researchers further recommend the creation of one National Open Access Repository for Nigeria. This should be accessible in all schools, colleges, universities and research institutions in Nigeria. This will minimize the cost for developing Institutional Repositories all over the

country.

REFERENCES

Akintunde, S. A. (2010). Blazing the trail: Institutional Repository at the University of Josll, Nigerian Libraries: *Journal of the Nigerian Library Association,* 43:1-19.

Anbu, K. (2010). Institutional Repositories: Time for African Universities to consolidate the digital divide. *Electronic Publishing Journal*, 9 (2), 32 – 38.

Anene, E., Alegbeleye, B. and Oyewole, O. (2017), "Factors Contributing to the Adoption of Institutional Repositories in Universities in South-West Nigeria: Perspectives of Library Staff. *Library Philosophy and Practice*", available at: http://digitalcommons.unl.edu/libphilprac/1508

Bashiru A. S. (2010) Issues and Challenges in the Creation of Institutional Repositories with Local Content: Critical Reflections. *Information, Society and Justice,* 3(1), 59-68.

Bonn, M. (2014), "Tooling up scholarly communication education and training", *College & Research Libraries News,* 75 (3), 132-135, available at: http://crln.acrl.org/content/75/3/132.full

Chang, C. & Aeernoudts, R. (2015), "Towards Scholarly Communication 2.0: Peer-to-Peer Review & Ranking in Open Access Preprint Repositories, Electronic copy", available at: http://ssrn.com/

Charbonneau, D. H., & McGlone, J. (2013, January). Faculty experiences with the National Institutes of Health (NIH) public access policy, compliance issues, and copyright practices. *Journal of the Medical Library Association,* 101(1), 12-19.

Czerniewicz, L. (2013), "Power and politics in a changing scholarly communication landscape Proceedings of the IATUL Conferences", available at: http://docs.lib.purdue.edu/iatul/2013/papers/23 (accessed 23 September, 2018).

Directory of Open Access Repositries Official Website (DOAR) (2017), available at: www.opendoar.org/countrylist.php#Nigeria (accessed 7 April 2018)

Egwunyenga, E.J. (2010) "Dystrophies and Associated Crises in Research and Academic Publications in Nigerian Universities" *Anthropologist,* 10(4), 245-250

Eke, H. N. (2011)."Digitizing resources for University of Nigeria repository: Process and Challenges." *Webology,* 8(1), 78 – 85.

Ezema, I. & Ugwu, C. (2013), "Electronic theses and dissertations in Nigeria university libraries: status, challenges and strategies", *The Electronic Library,* 31(4), 493-507,

Finlay, C, Tsou, A. & Sugimoto, C.R. (2015), "Scholarly communication as a core competency: prevalence, activities, and concepts of scholarly communication

librarianship as shown through job advertisements". *Journal of Librarianship and Scholarly Communication*, Vol. 3 No. 1, p. eP1236, available at: http://dx.doi.org/10.7710/2162-3309.1236

Kim, J. (2010). Faculty self-archiving: Motivations and barriers. *Journal of the American Society for Information Science and Technology,* 61(9), 1909-1922. http://doi.org/10.1002/asi.21336

Koler-Povh, T., Mikoš, M. & Turk, G. (2014), "Institutional repository as an important part of scholarly communication", *Library Hi Tech*, 32 (3), 423-434, available at: http://dx.doi. org/10.1108/LHT-10-2013-0146 (accessed 20 October, 2018)

Kunle, O. (2015), "Scholarly publication in Nigeria: implications of open access", *The WIPO Journal,* 23 (2), 115-129

Miller, J. E., & Seldin, P. (2014). Changing practices in faculty evaluation. *Academe*, 100(3), 35-38.

Moxley, J. (2013). Open textbook publishing. *Academe*, 99(5), 40-43.

Mohammed, A. (2013), "Institutional digital repository: an option for scholarly communication in Nigeria", *International Journal of Environmental Research, 5*(6), 21-30.

Musa, A., Musa, S. & Aliyu, A. (2014), "Institutional digital repositories in Nigeria: issues and challenges", IOSR *Journal of Humanities and Social Science* (IOSR-JHSS), 19 (1), 16-21

Musakali J.J & Moli, R. (2011). Open access in Africa publishing industry: opportunities and challenges. Retrieved 2nd May, 2018 from http//:www.kmafrica.com/?=node/153

Nykanen, M. (2011). Institutional repositories at small Institutions in America: Some current trends*. Journal of Electronic Resources Librarianship*, 23(1), 1-19. http://doi.org/101080/1941126X.2011.551089

Ogbomo, E. & Muokebe, B. (2015), "Institutional repositories as emerging initiative in Nigerian university libraries". *Information and Knowledge Management*, 5 (1), 15-24.

Oguche, D. (2016), "Enhancing scholarly communication in Nigeria: the role of open access institutional repositories", *Nigerian Current Legal Problems*, 7(2), 344-366.

Ramasamy, K., & Padma, P. (2015). Institutional repositories as an online archival service?: A quantitative study of open access institutional repositories of Japan as registered in Open Doar. *e-Library Science Research Journal*,3(4), 1–8.

Ridwan, S. (2015), "Institutional repository: a road map to open access and resources sharing in Nigeria (issues and challenges)", *International Journal of Scientific & Engineering Research,* 6 (1), 26-35.

Seaman, D. (2011). Discovering the information needs of humanists when planning an institutional repository. *D-Lib Magazine*, 17(3/4). http://doi.org/10.1045/march2011-seaman

Steele, C. (2013), "Recent developments in scholarly communication: a review", *The Australian Library Journal,* 62(3), 224-230, doi: 10.1080/00049670.2013.831392.

The Global Information Technology Report (2016), *The Global Information Technology Report,* available at: www3.weforum.org/docs/GITR2016/WEF_GITR_Full_ Report.pdf (accessed 14 September 2018)

Xia, J., & Opperman, D. B. (2010). Current trends in institutional repositories for institutions offering master's and baccalaureate degrees. *Serials Review*, 36(1), 10-18. http://doi.org/10.1016/j.serrev.2009.10.003

Xia, J., Gilchrist, S. B., Smith, N. X., Kingery, J. A., Radecki, J. R., Wilhelm, M. L., Harrison, K. C., Asby, M. L., Mahn, A. J. (2012). A review of open access self-archiving mandate policies. Portal: *Libraries and the Academy*, 12(1), 85-102. http://doi.org/10.1353/pla.2012.0000