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AIMS AND SCOPE

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To provide on a regular and sustainable basis an excellent scholarly journal for reporting empirical research findings in the information profession in Africa

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Open Access Publishing in Africa: Advancing Research Outputs to Global Visibility

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Abstract

The purpose of the study was to examine the status of Africa in the open access environment as well as the challenges of providing global visibility to African research outputs. A descriptive bibliometric approach was adopted for the study. Data was extracted from two world repository directories (Registry of Open Access Repositories - ROAR and Directory of Open Access Repositories - DOAR) and Directory of Open Access Journals – DOAJ to determine the presence of Africa and size of repositories and records found in the directories. Findings reveal that only 20 African countries have presence in ROAR and DOAJ, but 22 countries have presence in DOAR. South Africa has more repositories in ROAR and DOAR while Egypt has over 70% of African contributions to DOAJ. The subject coverage of the repositories indicates that there are more publications in the sciences than there are in the social sciences and humanities; the preferred languages of publication in the directories are English, German and French. Though there is slow adoption of publishing in open access journals in Africa, there has been an increase in the number of open access journal articles from 2,019 in 2005 to 24,997 in 2014. The paper calls on African governments, researchers and librarians to deploy sustainable mechanisms to increase global visibility of African research findings using open access platforms.

Keywords: Open Access, Institutional Repository, Scholarly Communication, Research Productivity, Research Visibility, Africa

Introduction

The adoption of open access scholarly communication in Africa has been an issue of great concern among scholars within and outside Africa (Bowdoin, 2011; Ezema, 2011; Chalabi and Dahmane, 2012; Ezema, 2013; Nwagwu, 2013; Fox and Hanlon, 2015). These scholars are concerned with the provision of a sustainable ICT infrastructure, capacity building and political will among African governments for the adoption of open access in Africa. The increasing interest in open access scholarly communication is because of the great opportunities which open access initiatives provide for wider dissemination of research findings, particularly among the developing countries. Open access movement evolved in response to paucity of research materials created by journal publishers who through business models for scholarly journals continuously increase the cost of journal subscription all over the world, as subscription fees overwhelm library budgets (Mann, von Walter, Hess and Wigand, 2009). In relation to this, Lewis (2012) and Akpokodje (2014) posit that open access emerged as alternative to high cost of journal subscription among libraries. It is a platform that offers scientists greater opportunities for wider dissemination of research findings without article-processing charges (Van Noorden, 2013). The open access movement evolved with the development of the World Wide Web in the 1990s, as researchers found a new platform for research dissemination on the Internet.

With this new information environment (that is, the WWW), interest in open access publishing tremendously increased, leading to the meeting of the Open Society Institute in 2001. The outcome of this meeting was the Budapest Open Access Initiative (see http://www.budapestopenaccessinitiative.org/

read) which provided different open access models, namely the gold route which relies on the traditional journal publication system, but shifts the financial burden to the authors or the research funders and the green route model which relies on authors archiving their publications in repositories in the form of pre-print or post-print (Sanchez-Tarrago and Fernandez-Molina, 2009; Peekkhaus and Proferes, 2015). The Budapest Open Access Initiative (BOAI) has been described as the "first internationally focused formal statement to articulate a comment to open access" (Peekkhaus and Proferes, 2015). Paragraph three of the BOAI clearly defines the concept of open access as provided by the initiative:

> By "open access" to this literature, we mean its free availability 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.

Other open access movements or initiatives followed shortly after the Budapest Initiative, and these include Bethesda Statement on Open Access (2003) which focuses on access to biomedical research and the Berlin Declaration on Open Access (2003) which was adopted for science and humanities research. All these are aimed at advocating for the provision of free access to scientific information to assist researchers and libraries globally and more particularly in developing countries (Peekkhaus and Proferes, 2015; Fox and Hanlon, 2015). This development is a reflection of earlier scholarly communication pattern before the debut of the journal. Nwagwu and Onyancha (2015) recently submitted that early scientific communication was even more open than is being canvassed now through OA initiative, and therefore predicted the death of the journal as a channel for communication of research reports.

Since the advent of open access movement, African scholars and institutions have been struggling to key into this initiative for global dissemination of their research reports using the platform. Self-archiving offers researchers opportunity of depositing their research reports (in the form of preprints or post prints) in open repositories (Onyancha, 2011); while open access journals publish research reports, which are freely made available to scholars without any access barriers. The last two decades have witnessed an increase in publication of open access journals funded through article-processing charges (APC) from authors (Fox and Hanlon, 2015) or through funding from agencies and organisations such as universities. The Directory of Open Access Journals (DOAJ) (see https://doaj.org/) was launched in 2002 during the First Nordic Conference on Scholarly Communication (Stenson, 2011). Since then, DOAJ hosts a number of open access journals from many countries all over the world under the Creative Commons Attribution license (https://creativecommons.org/licenses/by/2.0/) which permits sharing (copy and redistribute the material in any medium or format) and adapting (remix, transform, and build upon the material) for any purpose, even commercially.

The benefits of this new publication platform have been reported in a number of published works. While Hitch (2005) and Ezema and Ugwu (2013) demonstrate that open access (OA) publishing increases citation impact; Garner, Horwood and Sullivan (2001) have noted that OA ensures speedy dissemination of research findings to a wider audience and ensures adequate archiving of scientific data. Similarly, Correia and Teixeira (2005) remark that open access drives creation of institutional repositories that are now current indicators of universities' quality, prestige and global visibility. But even with these benefits, there has been reported a slow response in the adoption of institutional repositories in Africa (Kakai, 2009; Adewumi and Ikhu-Omoregbe, 2010; Ezema, 2011; Zaid and Okiki, 2015) when compared with other regions such as Europe and America. While Ezema (2011) canvassed for creation of awareness among libraries and researchers, Zaid and Okiki believe that building collaboration among libraries would improve the situation.

Though low research productivity has been reported in Africa (Ezema, 2010; Gailard, 2010; Nwagwu, 2013), the greatest challenges that African researchers face include poor visibility and dissemination of their research reports (Ezema, 2013). A large proportion of local content materials often regarded as grey literature such as theses and dissertations, conference/seminar papers, inaugural lectures, and others, are poorly distributed for international visibility and thus present Africa as bereft of research production (Chisenga, 2006; Ezema, 2013). Consequently, Africa is often regarded as only consumer of scientific research productivity, leading to low ranking of African universities as revealed in *The Times Higher Education's* (2015) World University Rankings 2014-2015, powered by Thomson Reuters. It appears that the low visibility and the ranking of African universities are linked with inability to adopt open access publication.

Since the development of open access movement many studies have investigated the constraints to adoption of open access publishing in Africa. This study focuses on the status and adoption of open access movement in Africa using freely available global repositories such as open DOAR, DOAJ and ROAR to enhance wide dissemination of their local contents and global visibility of its research outputs. Specifically, the study intends to:

i. Determine the contributions of Africa in the world repository directories.

ii. Find out the types of contents in the African repositories.

iii. Identify the archiving software for the African repositories.

iv. Determine the subject coverage of open access publications in Africa.

v. Identify the most frequently used languages in open access publishing in Africa.

vi. Determine the trends in the growth of open access publishing in Africa.

Brief Literature Review

Open access movement provides researchers with opportunities of free availability of scientific information (Nwagwu, 2013), as it increasingly breaks down access barriers which for years have slowed down universal availability of scientific information. Since the launch of OA initiative over twenty years ago, the number of OA journals has been growing at the rate of 30% per annum (Laakso, Welling, Bukvova, Nyman, Bjork and Hedlund, 2011), and approximately half of the articles are published in journals with article-processing charges (Solomon and Bjork, 2012). Scholars have identified the challenges of OA publishing in Africa; some of which include funding shortages (McKay, 2011; Ezema, 2011), language barriers (Bowdoin, 2011; Chalabi and Dahmane 2012), inadequate ICT infrastructure, and highly skilled ICT experts (Ezema, 2011; McKay, 2011; Nwagwu, 2013). The technological challenges suggest low web usage and lack of access to the global scientific information on the web (Nwagwu and Ibitola, 2010), resulting in skewed distribution of knowledge in favour of the West. Other hindrances to open access publishing bother on institutional inertia because of doubt of its acceptability by some institutions for promotion, retention of tenure and access to research grants (Mann, von Walter, Hess and Wigand, 2009; Harley, Earl-Novell, Arter, Lawrence and King, 2007; Schonfeld and Housewright, 2010) and creation of awareness (Utulu and Bolarinwa, 2009; Swan and Brown, 2004). The study of Utulu and Bolarinwa (2009) reported increasing awareness of open access publications, but with low use as publication channel. While the study of Harley et al. (2007) raised the concern on the prestige of OA journals, Schonfeld and Housewright (2010) remark that researchers are more interested in publishing in journals which will not present any doubt when submitted for promotion.

However, a study by Bjork and Solomon (2012) observes that research grantors have started requesting for open access publishing from grantees. For instance, the National Institute of Health requires open access publishing for all its funded research to reduce the cost of subscription of health researchers (Roehr, 2004). Another study also found an increasing open access publishing from sponsored research (Bjork, Welling, Laakso, Majlender, Hedlund and Gounason, 2010). Another impediment to open access is the perceived poor editorial quality and peer review mechanism (Rowlands, Nicholas and Huntington, 2004; Nicholas and Rowlands, 2005). The belief of many is that OA publishing does not

pass through proper journal peer review processes; therefore, it is usually rejected when submitted for promotion or other research appraisal purposes. This perceived low ranking of open access journals is demonstrated in the study by McVeigh (2004) who reports that OA journals were heavily represented in low ranking journals found in Journal Citation Report of Thompson Reuters of 2003. However, this may not be unique to only OA journals because the skewed citations reports of Thompson Reuters have been reported in a number of literatures (Loonen, Hage and Kon, 2007; Moed, 2005; Meho 2007). A later study by Giglia (2010) using the Directory of Open Access Journals (DOAJ) found that of 355 science-based OA journals, only 38% are in Science Citation Index, while of 30 OA journals (54%) are in Social Science Citation Index – showing a little improvement in ranking from McVeigh's (2004) study.

Another major constraint of adoption of open access publishing is funding. The development of institutional repositories to drive open access archiving requires huge capital, which many universities may not afford without support from funding bodies such as government and other local and international organisations interested in funding research. Unfortunately, in Africa, governments pay lip services to research and scholarship. Nwagwu (2013) has alluded to this in the unarticulated OA policy by government agency such as the National Universities Commission which has the mandate to regulate all Nigerian universities. The same situation may likely repeat itself in other African countries. Another challenge is the reluctance of authors to send their papers to OA journals that levy article-processing charges (Eysenbach, 2006), as observation has shown that assessment charges are usually high.

Despite some of these constraints, studies have shown a growing interest in accessing OA research materials because of several perceived benefits such as visibility and increased availability of scholarly research outputs (Ezema, 2011; Bjork and Solomon, 2012), greater citations and impact influence (Eysenbach, 2006) and higher readership penetration (Davis, 2011). The study of Davis (2011), however, posits that the real beneficiaries of open access publishing are not necessarily the research community but the consumers of scientific information who rarely produce any research finding.

There have been attempts to provide evidence of Africa's contributions to open access scholarly communication in studies such as Fox and Hanlon (2015). Though the study found a low visibility of African institutional repositories, it provided statistical evidence of an increase in open access journals found in DOAJ, with Egypt leading other African countries. A study by Chimah, Ugwoke and Ogwo (2015), using Registry of Open Access Repository (ROAR), found that Nigeria has only nine repositories, representing only 0.23% of the world total. Apart from South Africa, the study failed to provide statistics on other African countries. Another study by Stenson (2011) found that 66% of the journals in DOAJ is published in Europe and North America, while only 2% is published in the whole of Africa, an increase from 1% in 2008. The study by Mann, von Walter, Hess and Wigand (2009) found that 90% of 481 respondents agree that open access publishing will guarantee free availability of research literature, but only 28% had published in open access platform. This implies a high level of access to OA publications, but reluctance in publishing using open access medium. A related study by Sanchez-Tarrago and Fernandez-Molina (2009) on open access publication in Cuban health research also found a low publication rate in open access journals, but revealed that 85% of the researchers agree to archive their publications in open access institutional repositories. This is related to the study by Frass, Cross and Gardner (2013) which reports that majority of the respondents agree to free availability of research literature, but only 40% of them choose to publish in OA journals, and 34% have really published using OA channels. Dalton (2011) also found that open access option has a relatively low consideration among researchers in the choice of publication channels. However, Xia (2010) reports an increasing awareness of OA publishing using a longitudinal study spanning four years. According to the study, the awareness has increased from 50% in mid 1990s to 85% by 2007.

Other studies have focused on citation penetration of open access journals. One of such studies is by Hajjem, Harnad and Gingras (2005) which found that open access articles have more citations consistently, than non OA articles; citation advantages vary from 36% to 172%. This is in line with an earlier study by Lawrence (2001) which

equally found that OA articles in computer science have more citations than non OA articles.

The relationship between open access publishing and global ranking has also been investigated by Onyancha (2015) using Research gate – a social media platform which allows researchers to self-archive their publications for global visibility and access. The study found a positive correlation between publications in open access outlet and ranking of universities. Similarly, Wren (2005) found a positive correlation of access of article from a non-journal website and the journal impact factor.

Another study by Adewumi and Ikhu-Omoregbe (2010) looked at the archiving software used in the management of institutional repositories in Africa and found that DSpace and EPrint are the most popular. It appears that many of the studies in open access initiatives in Africa focused mainly on challenges which impede the adoption of open access scholarly communication and software utilisation. The few studies that investigated current status of Africa such as Fox and Hanlon (2015) merely provided scanty information on the number of institutional repositories and OA journals without providing details. This informed the need for the present study.

Research Methods and Materials

The study adopted a descriptive informetric approach to determine the status of Africa in the open access initiative in terms of the number of repositories, number of open access journals, and number of records deposited in the repositories as well as published in OA journals. Data was extracted from repository directories (that is, the Registry of Open Access Repositories – ROAR, http://roar.eprints.org/ and Directory of Open Access Repository – DOAR, http://www.opendoar.org/) and Directory of Open Access Journals – DOAJ, ROAR and DOAR provide data on the number of registered repositories throughout the world. While the data in ROAR is limited to the number of repositories, software used for archiving, types of repositories and number of records, DOAR provides all the aforementioned types of data as well as an in-built mechanism for determining the repository statistics. Both directories can be searched by types of repository, geographical location of the repositories, types of archiving software, etc. As at November 9, 2015, DOAR had 2987 repositories. DOAJ provides data on open access journals from all over the world and has in-built mechanism to conduct search by journal, geographical region, article searches, among others. As at November 9, 2015 when data was extracted, the directory hosted 10,708 journals from 136 countries of the world.

Data was extracted into Microsoft Excel within four days (November 7 – 11, 2015) for computation. In both ROAR and DOAR, data for each country was extracted by typing the country name in the search field of the directory and through that process the number of repositories and records were generated. The same process was used to extract data from DOAJ. However, data concerning subject coverage, frequently used languages, and trends in the growth of open access journals were extracted by additional query of the database using the in-built mechanism for generating such information. All African countries with any open access presence from the three directories were included in the study. For the trends in open access growth, data was generated for ten years period (2005 – 2014) in line with the period open access awareness began in Africa as indicated by Ubogu (2006). Data was analysed using descriptive statistics of frequency and percentages and presented in tables and charts.

Results

The findings are presented and discussed in line with the objectives of the study, namely contribution of African countries to the world's repositories, content types of repositories in Africa, subject coverage of OA journals, language of publication in the repositories; and growth of OA publishing in Africa.

African Contributions to the World's Repository Directories

Table 1 reflects that Africa had 136 (3.4%) out of 4055 repositories in ROAR wherein South Africa ranks first with 47 (34.6%), followed by Kenya with 14 (10.3%), and Egypt and Nigeria with 11 (8.1%) repositories apiece. Only twenty African countries out of about 56 had any form of repository in ROAR.

A close observation shows that only five countries had up to 10 repositories while half of the contributors had less than three repositories each. The four top ranked countries (South Africa, Kenya, Egypt and Nigeria) contributed over 60% of the entire repositories from Africa. Egypt had the highest number of records in the directory, followed by South Africa. However, the numbers of records in the repositories of many of the countries are unknown, while others were partially provided. For instance, the number of records for Kenya with second highest number of repositories is unknown, while Nigeria with 11 repositories had information on only one of the repositories. The unavailable number of records in the repositories implies poor visibility of the universities in Africa despite the presence of repositories in their names, and this makes African region to trail behind other continents in global visibility of universities.

Table 2 shows the sub-regional distribution of the repositories, which indicates that Southern Africa, had the highest number of repositories with 45 (34.09%), followed by East Africa with 35 (26.52%) repositories, North Africa with 27 (20.45%), West Africa with 23 (17.42%), and Central Africa with only 2 (1.52%). However, North Africa had the highest number of records with 374,898 (46.97%), followed by Southern Africa with 235,321 (29.48%), and East Africa with 125,777 (15.76%). The contribution of Africa in the global distribution of repositories in DOAR is comparably low. The continent contributed only 132 (4%) of the global total of 2987, as can be seen in figure 1. Europe alone has nearly half (44%) of the global total.

Table 1: Distribution of African Repositories in Registry of Open Access Repositories (ROAR)

Rank	Countries	No of Repositories (N = 136)	%	No of Records	Remarks
1	South Africa	47	34.6	5763	Records for only 23 repositories
2	Kenya	14	10.3	NA	Unknown number of records
3	Egypt	11	8.1	7505	Records for only 3 repositories
4	Nigeria	11	8.1	98	Records for only 1 repository
5	Zimbabwe	9	6.6	502	Records for only 2 repositories
6	Algeria	7	5.1	NA	Unknown number of records
7	Tanzania	7	5.1	264	Records for only 2 repositories
8	Ghana	6	4.4	90	Records for only 1 repository
9	Sudan	5	3.7	NA	Unknown number of records
10	Morocco	3	2.2	NA	Unknown number of records
11	Lesotho	2	1.5	NA	Unknown number of records
12	Mozambique	2	1.5	256	For the 2 repositories
13	Namibia	2	1.5	241	Records for only 1 repository
14	Senegal	2	1.5	NA	Unknown number of records
15	Tunisia	2	1.5	NA	Unknown number of records
16	Uganda	2	1.5	171	Records for only 1 repository
17	Botswana	1	0.7	NA	Unknown number of records
18	Cameroun	1	0.7	26	Records for only 1 repository
19	Malawi	1	0.7	171	Records for only 1 repository
20	Rwanda	1	0.7	NA	Unknown number of records
	Total	**136**	**100**		
	World Total	**4,055**	**3.4**		

Table 2: Distribution of African Regions by Contribution to DOAR

African Region	No of Repositories N = 132	%	No of Records N = 798,158	%	Mean records/Rep.
Central Africa	2	1.52	69	0.009	34.5
East Africa	35	26.52	125.777	15.76	3593.6
North Africa	27	20.45	374,898	46.97	13885.1
Southern Africa	45	34.09	235,321	29.48	5229.4
West Africa	23	17.42	62,093	7.78	2699.7

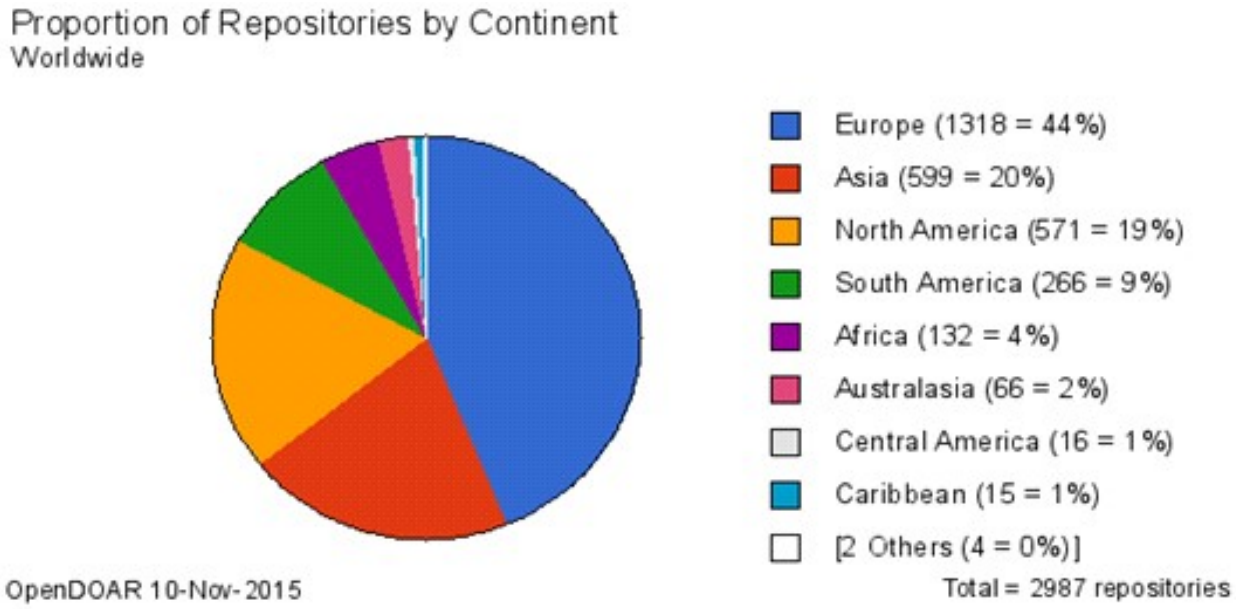

Figure 1: Global distribution of repositories in DOAR

Types of Contents in the Open Access Repositories

The leading types of contents found in the repositories of open DOAR were journal articles (73%), followed by theses and dissertations (71%), and conference and workshop papers (46%). It is clear from figure 2 that Africa had low production of datasets since it is the lowest type of content found in African repositories in DOAR with only 3(2%) repositories archiving datasets. In figure 3, we could see that African repositories were more of institutionally-based rather than discipline or government-based. A total of 120 (91%) of them were institutional repositories, while 8(6%) were discipline-based repositories (institutional repositories are usually established by universities, research institutes and other institutions of higher learning, while discipline-based repositories are often established by professional bodies); aggregating repositories were 2 (2%) and government repositories were 2 (2%) showing that African governments lack interest in open access initiatives.

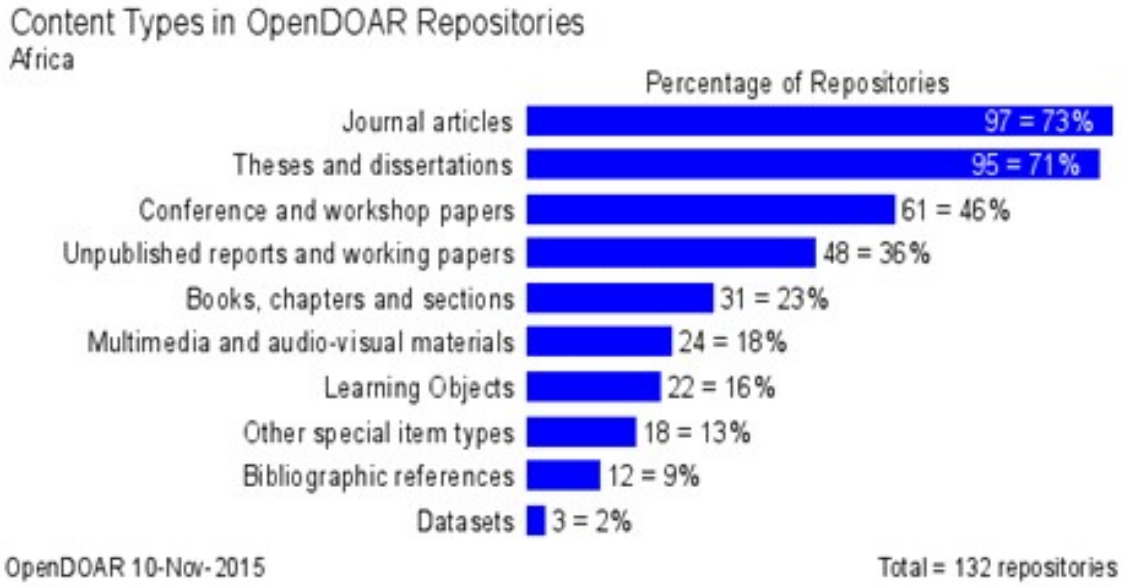

Figure 2: Types of Contents in African repositories

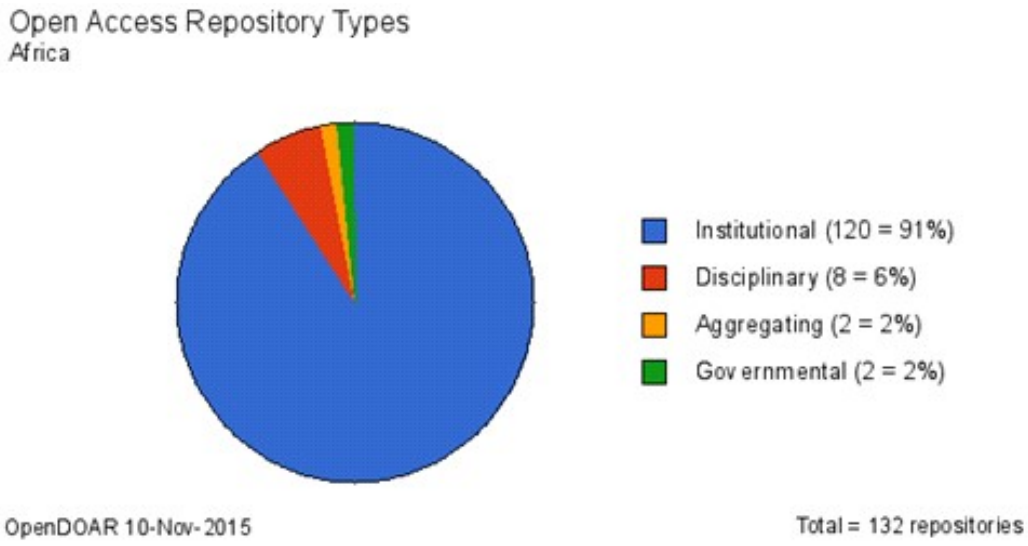

Figure 3: Types of African Repositories in DOAR

Software Used to Develop the Repositories in Africa

In the development of institutional repositories, there is often a choice between open source software, which is freely available online, and proprietary software, which is purchased from vendors. A total of 97 (73%) repositories adopted DSpace for archiving, making it the most dominant software used among African repositories found in DOAR. This was followed by EPrint with 12 (9%) while 4 (3%) archive their documents using Greenstone. Information on archiving software of 7 (5%) repositories was not known, while 2 (2%) of the repositories adopted ContentPro. Other archiving software used was Drupal and CONTENTdm. While there was no explanation on the archiving software for 6 (5%) other repositories, indications showed that DSpace was the most preferred repository software, probably because it is an open software (which is relatively cheap to install and maintain) with user-friendly features, as it had been noted by Adewumi and Ikhu-Omoregbe, (2010).

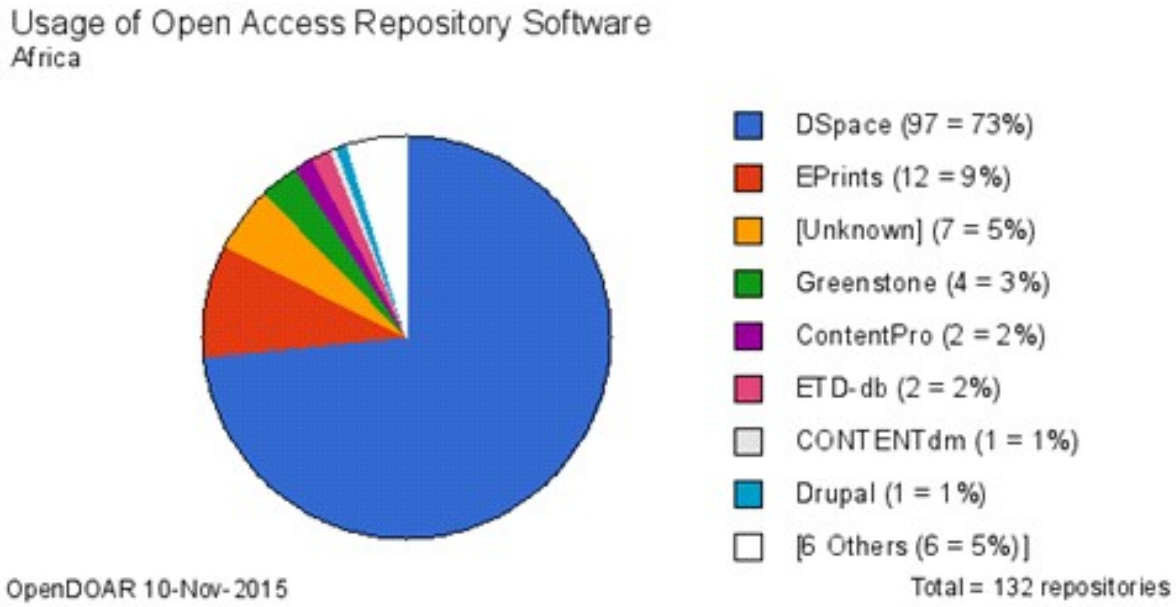

Figure 4: Repository Software in DOAR

African Contributions to Directory of Open Access Journals (DOAJ)

African contributions to Directory of Open Access Journals presented almost a similar picture in regard to the contents as in ROAR and DOAR; almost the same countries re-appear as shown in Table 3. Africa contributed 696 OA journals, accounting for a mere 6.5% of the 10,712 global journals contributions as reflected in DOAJ. Twenty African countries registered their presence in DOAJ with Egypt contributing 538 (77.3%) journals, followed by South Africa with 75 (10.78%) journals, and Nigeria with 36 (5.17%) journals. Morocco and Kenya contributed 9 (1.29%) and 7 (1.01%) respectively. In sub-regional distribution of African journals contribution, North Africa contributed 564 (81.03%), Southern Africa contributed 76 (10.92%) and West Africa contributed 37 (5.32%). East and Central Africa contributed 15 (2.16%) and 4 (0.57%) respectively. However, East Africa had higher mean articles per journal (416.8), followed by Southern Africa (329.6) and North Africa (201.6). Central Africa and West Africa had very low mean articles per journal with 93.3 and 20.9 respectively.

Table 3: Distribution of African Contribution to DOAJ

African Region	Countries	No of Journals N = 696	%	No of Articles N = 146,152	%	Mean Article/ Journal
Central Africa	Burundi	1	0.14	147	0.10	147
	Cameroon	1	0.14	108	0.07	108
	Congo DR	1	0.14	90	0.06	90
	Rwanda	1	0.14	28	0.02	28
	Total	**4**	**0.57**	**373**	**0.26**	**93.3**
East Africa	Kenya	7	1.01	1396	1.00	199.6
	Mauritius	2	0.28	2930	2.00	1465
	Tanzania	1	0.14	1318	0.90	1318
	Zambia	2	0.28	476	0.33	238
	Uganda	3	0.43	132	0.09	44
	Total	**15**	**2.16**	**6,252**	**4.30**	**416.8**
North Africa	Algeria	6	0.86	101	0.07	16.8
	Egypt	538	77.30	111067	75.99	206.4
	Ethiopia	5	0.72	906	0.62	181.2
	Libya	2	0.28	215	0.15	107.5
	Morocco	9	1.29	530	0.36	58.9
	Sudan	1	0.14	813	0.56	813
	Tunisia	3	0.43	71	0.05	23.7
	Total	**564**	**81.03**	**113,703**	**77.80**	**201.6**
Southern Africa	Madagascar	1	0.14	131	0.09	131
	South Africa	75	10.78	24,921	17.05	332.3
	Total	**76**	**10.92**	**25,052**	**17.14**	**329.6**
West Africa	Ghana	1	0.14	13	0.01	13
	Nigeria	36	5.17	759	0.52	21.1
	Total	**37**	**5.32**	**772**	**0.53**	**20.9**
	African Total	**696**	**100**	**146,152**	**100**	**210.0**
	World Total	**10,712**	**6.50**	**2,012,039**	**7.26**	**187.8**

Subject Coverage of Open Access Publications in Africa

A look at the subject coverage of the open access repositories found in DOAR revealed that majority of them (i.e. 88 or 66%) were multidisciplinary as indicated in Figure 5. Science-related fields had more coverage in the repositories than humanities and social science. The science fields covered were general science, which had 16 (12%) repositories; the agriculture, food and veterinary science group had 15 (11%); and ecology and environment which had 11 (8%). Apart from these, health and medicine had 15 (11%), technology had 12 (9%), while computer and information technology had 11 (8%) repositories. Social sciences received more coverage than humanities as evident in Figure 5. Business and economics had 17 (12%) repositories; law and politics; 16 (12%) repositories; general social sciences; had 14 (10%) repositories while education had 12 (9%) and library and information science 9 (6%) repositories. In the humanities, language and literature had the highest with 9 (6%), followed by history and archaeology with 7 (5%) repositories. It is important to note that some of these subject fields overlap, as a particular repository may cover two or more subject areas.

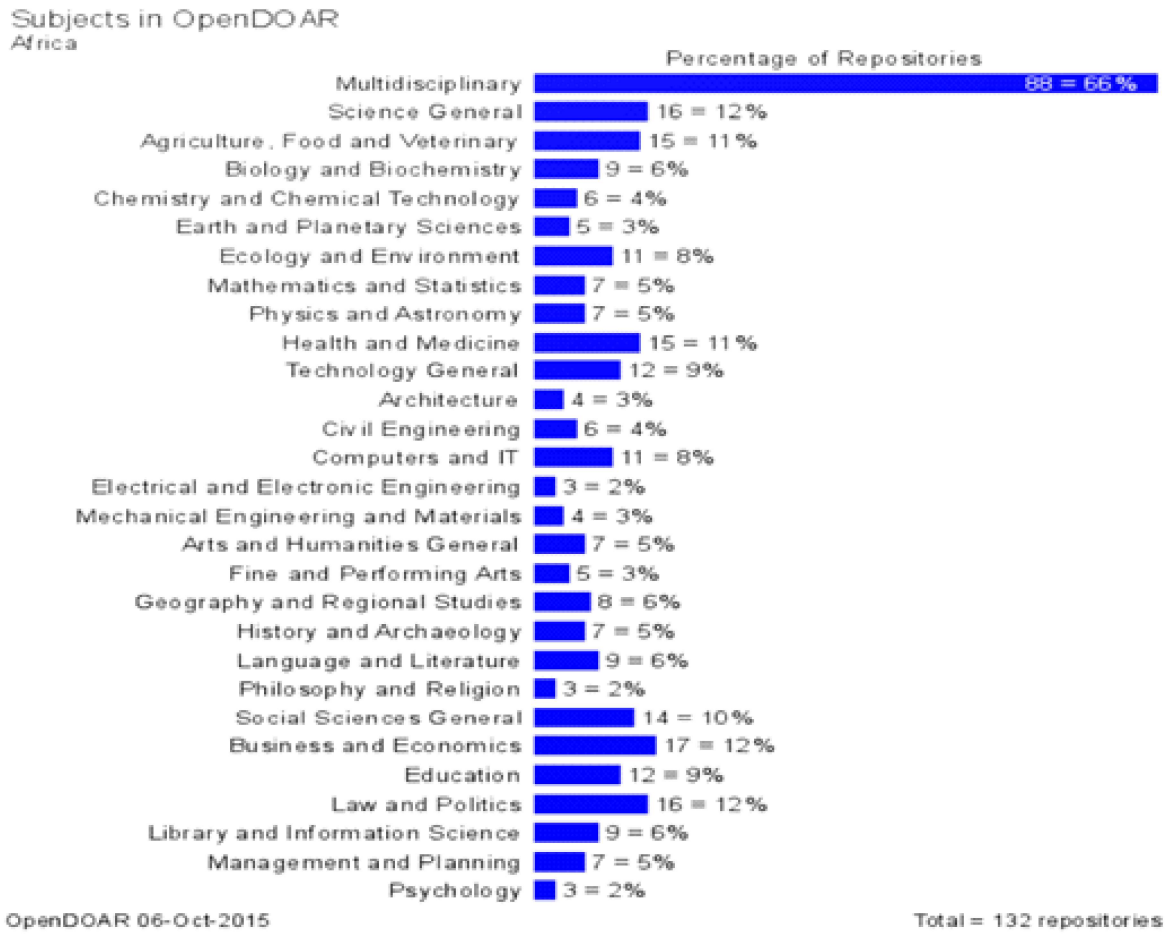

Figure 5: Subject Coverage of Open Access Publications in Africa

Most Frequently Used Language in Open Access Publishing in Africa

In scholarly communication, language of research publication is critical to international scientific publication. Olaoye (2009) has remarked that man's access to knowledge is facilitated through the use of languages. Thus, it is usually difficult for a researcher to comprehend research paper written in a strange language. Scientific publications in African languages are often considered as strange to the global scholarly community; and consequently, observations have shown that they are rarely indexed by major databases such as Thomson Reuters, Scopus, Medline and Google scholar. This reduces the visibility of research published in African languages.

In figure 6, English was the dominant language of the publications in the open access repositories found in DOAR with 122 (92%), followed by French with 20 (15%); Arabic 13 (9%); while Afrikaans had 5 (3%). Other languages used in publishing research reports in the repositories were Dutch with 3 (2%) and Portuguese 2 (1%). Apart from Afrikaans; other African languages represented in the repository were Sesotho, 2 (1%); Swahili 2 (1%) and Amharic 1 (0.7%). Generally, publications in African languages were few, with almost all the African languages coming from Eastern and Southern Africa. In DOAJ (see Table 4); English was also the dominant language with133;044 (89.9%) records, followed by German with 4890 (3.3%); French 2957 (2.0%) and Dutch 2110 (1.4%). The most frequently used African language is Afrikaans with 1338 (0.9%), followed by Isipedi with 1160 (0.8%) records; the two are South African languages.

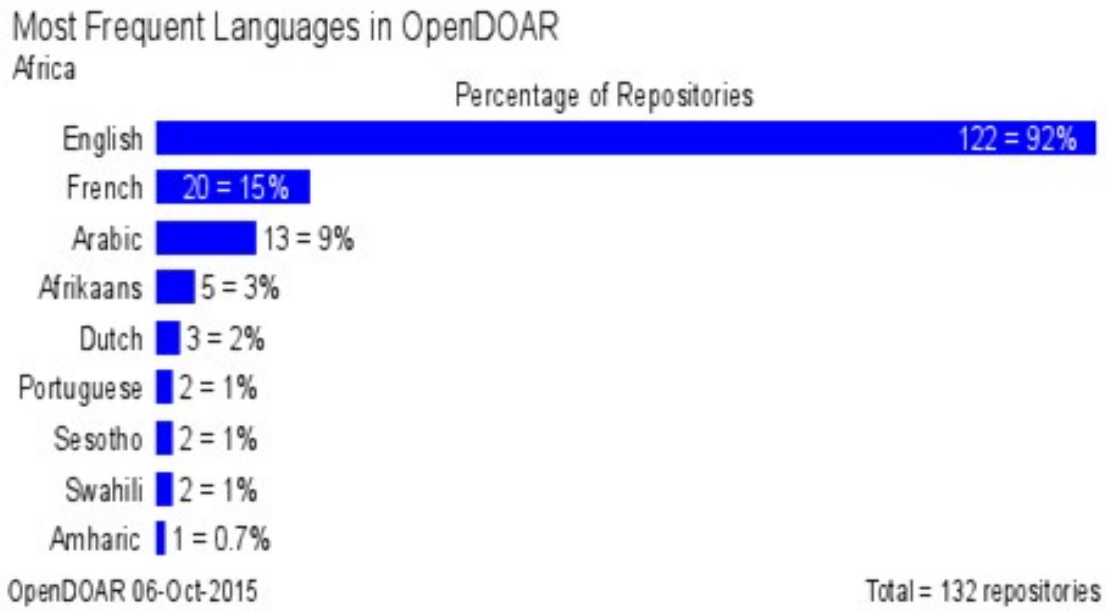

Figure 6: Frequently Used Language in Open Access Publishing

Table 4: Frequently used languages of publications in DOAJ

Language	Freq. (N = 148,039)	Percentage
English	133,044	89.9
German	4890	3.3
French	2,957	2.0
Dutch	2110	1.4
Afrikaans	1338	0.9
Isipedi	1160	0.8
Spanish	716	0.5
Arabic	654	0.4
Portuguese	301	0.2
Italian	164	0.1
Turkish	145	0.1
Russian	140	0.1
Japanese	134	0.1
Czech	134	0.1
Xhosa	121	0.1
Dutch Flemish	12	0.01
Romania	8	0.01
Chinese	7	0.01
Serbian	4	0.01
Total	**148,039**	**100**

Trends in Open Access Publishing in Africa

The trend of open access publications in Africa drawn from DOAJ is shown in Figure 7. The ten-year trend (2005 –2014) indicated a very low level of open access publishing in 2005 with 2,019 articles, which increased to 2,340 in 2006. By 2009, it had doubled to 4,881 publications; and by 2010, it rose to 7,261 publications. The number of open access publications in 2011 was 12,019 but jumped to 21,086 in 2012 (almost double within a year), and then began to grow slowly between 2012 and 2013, but rapidly increased to 24,997 publications in 2014.

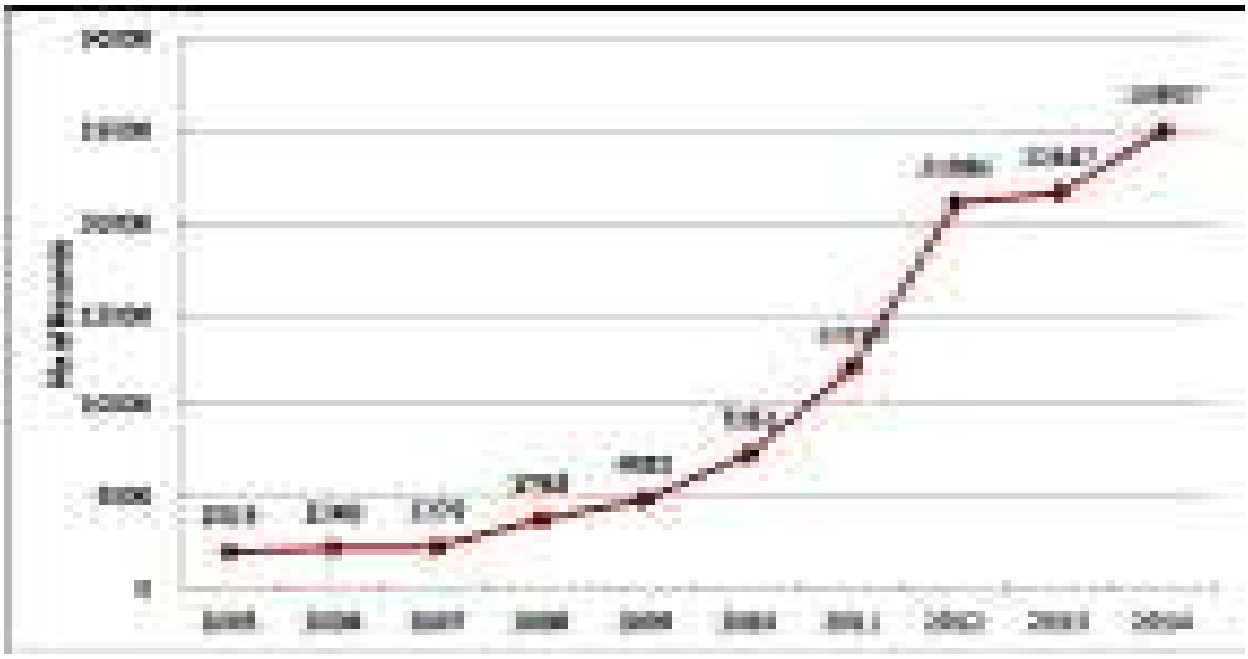

Figure 7: Ten-Year Trend of Growth of Open Access Publishing in Africa (2005 - 2014)

Discusion

The findings of the study present the realities of the involvement of African countries in open access publishing. Twenty-seven African countries did not have any presence in OA publishing, resulting in low contributions to the global open access publications. Though twenty African countries registered their presence in ROAR and DOAR, only 4 of them (South Africa, Egypt, Nigeria and Kenya) had substantial number of repositories and records. This is in line with the findings of Fox and Hanlon (2015) and Chimah, Ugwoke and Ogwo (2015) who also found a low visibility of African institutional repositories as South Africa and Egypt lead open access publishing in Africa. The absence of so many African countries in OA movement is surprising because the thinking was that OA is a good opportunity for developing countries to disseminate their research outputs to the global scholarly community. It appears that researchers in such countries are yet to accept open access publishing as a means of disseminating their research outputs which Dalton (2011) identified as one of the contraints of OA publishing. Another explanation could be that the people charged with the establishment of OA repositories have not done their work, resulting in researchers' lack of access to the facilities.

Although not surprising, considering the reported low research output in Africa (see Ezema, 2010; Gailard, 2010; Nwagwu, 2013), the contributions of Africa to OA movement are comparably low. The region had only 3.4% contributions to ROAR and 4% contribution to DOAR while Europe contributed 44% to DOAR. The concern here is that Africa is finding it difficult to bridge the visibility gap, even with the advantages of open access environment.

Other findings indicate that journal articles, theses and dissertations are the dominant contents of the repositories in Africa. This is expected because large proportion of reseach outputs all over the world are usually disseminated through the journals while postgraduate research is on the increase (Uborgu, 2006). Beside this, there is large archiving of theses and dissertations because they are part of the requirements of the students before they are awarded degrees at both undergraduate and post graduate levels. Since majority of the repositories are institution-based, the contents will be dominated by research emanating from the staff and the students of the institutions. Observations have shown that

institutions usually began by archiving theses, dissertations and staff publications which are often found in journals. More importantly, copyright infringement is usually considered when archiving materials in the repositories. Consequently, materials that permit self-archiving without copyright infringement such as theses, dissertations and open access journals were usually given more consideration than books which would require permision from the copyright owners. That probably explains the low number of repositories which archive books and book chapters.

Governments' lack of interest in education and research is demonstrated by the number of government repositories present in DOAR. This has been the major challenge in open access movement in Africa. The major funder of research all over the world is government; and without the required funding, universities and other research bodies will find it almost impossible to establish repositories of international standard. The government's role in funding of research has been highlighted by Nwagwu (2013) who also points out that some government agencies in charge of education and research lack the policy framework for open access movement in Africa.

The most popular archiving software used in African repositories is DSpace used by over seventy percent of the repositories. Though EPrint and Greestone are equally used, they are not as popular as DSpace, which recorded encouraging presence in DOAJ, even though the major contributors remain South Africa, Egypt, Nigeria and Kenya. The dominance of South Africa and Egypt in open access movement in Africa is demonstrated by their size of journal contributions and articles in DOAJ in relation to other countries. This dominance has been reported in an earlier literature. A common characteristic of the archiving software used by African repositories is that they are all open source software. This is in line with the finding of Adewumi and Ikhu-Omoregbe (2010) in their study of features, architecture, and design of African institutional repositories and Onyancha (2011) in his study of self-archiving by LIS schools in South Africa. The choice of open software is probably because of the cost effectiveness and user-friendliness of the software.

While the presence of African countries in ROAR and DOAR remains almost the same, findings show that some countries such as Mauritius, the Democratic Republic of the Congo, Libya and Madagascar, did not feature among the countries that are visible in two repositories such as Fox and Hanlon (2015). An interesting thing about the finding is the increasing growth of open access journals in Africa. From two percent as reported by Stenson (2011), it has moved to 6.5% to 2015 as seen in Table 3. This growth rate is likely to be linked with increasing campaigns for open access publishing as documented in earlier studies (see Utulu and Bolarinwa, 2009; Swan and Brown, 2004; Mann, von Walter, Hess and Wigand, 2009).

The most preferred language of publication for both the repositories and the directory of open access journals is English. This is expected, considering the position of English language in the global communication and the colonial background of many of the countries publishing in open access environment. French and German languages equally had sizeable shares in the language of publications in Africa open access movement, and this also relates with the colonial experience of African countries which adopt the languages of their former colonies as their official languages. It is however a source of worry that African indigenous languages were rarely used in research publications apart from Afrikaans and Isipedi, both from South Africa. Unfortunately, a large proportion of publications in African languages may not have global visibility since papers indexed in major databases are skewed in favour of English and other major languages of the world.

The findings show an increasing growth of open access publication in Africa even with the constraints reported in extant literature (see McKay, 2011; Ezema, 2011; Bowdoin, 2011; Chalabi and Dahmane 2012; Nwagwu, 2013). It is interesting to see that within ten years, open access publishing in Africa has grown from 2,019 articles in 2005 to 24, 997 articles in 2014. This is likely to be connected with the increasing awareness in open access publishing as reported by Xia (2010) and more acceptances given to it by granting agencies, as documented in earlier research by Bjork, Welling, Laakso, Majlender, Hedlund and Gounason, (2010). If this growth rate is sustained in DOAJ and more institutions join in archiving their research reports in open repositories, Africa may be on the way to enhance the visibility of their research reports.

Conclusion and Recommendations

Although findings of this study reveal an increasing growth of open access publishing in Africa, it is obvious that there is still a lot to do considering the huge opportunities OA presents to developing countries to aggregate their research reports for global visibility. The major challenge of Africa is beyond research productivity; it is more of creating international visibility for African research. With about 56 independent countries and several universities and research centres, Africa has huge research potentials. Nigeria alone has 141 universities (National Universities Commission, 2015), and other African countries have relatively large number of universities. Regretably, only twenty African countries have open access presence.

About the fate of the other countries in relation to open access publication, could it be that such countries lack awareness about OA movement? or they are yet to graple with the ICT infrastructure which drive OA publishing. Evidently, the twenty countries with open access presence are yet to explore their full potentials in OA publishing. For instance, a country such as Nigeria with the huge number of universities had less than twenty repositories and only 36 open access journals in DOAJ. Should the 141 universities establish a repository each, Nigeria would boast of over a hundred repositories with large number of records. This is likely to be the same situation in other countries, particularly countries with few number of repositories.

African governments, researchers, libraries and librarians should strategise on enduring framework to exploit the opportunities offered by OA movement to its full potential. As it has been noted in a number of published works (e.g. Ezema, 2011; McKay, 2011), funding is very critical to the adoption of OA publishing, particularly as it relates to establishing institutional repositories. African governments need to address this. Open access initiative is expected to be a priority of various African governments in terms of building ICT infrastructure which will drive the movement. The poor ICT infrastructure in many African countries have been highlighted as key impediment of OA publishing by McKay (2011) and Nwagwu (2013), and a recent study (Fox and Halon, 2015) reports no sign of improvement. African Union should put a sustainable ICT development plan through its agency the New Partnership for Africa's Development (NEPAD). In addition to this, African governments need to key into international best practices in development of government repositories for open government data. This is a social responsibility that will guarantee adequate citizen involvement in democratic governance.

University regulatory bodies in all African countries have important roles to play to ensure that African universities key into the OA initiatives through critical policy framework for OA publishing to enhance increased visibility of African research findings. Nwagwu (2013) had earlier remarked that some of these regulatory bodies provide little or no OA policy framework to support OA movement in the universities. Such policies, apart from providing OA guidelines, should make OA presence as part of the criteria for accreditation of programmes in the universities.

Open access publishing is critical to the survival of African researchers. Apart from providing universal access to the global research literature, it ensures the democratisation of research publishing. Therefore, African researchers should see OA publishing as a unique opportunity to improve on their global visibility through self-archiving of their publications in repositories and publication of their research in open access journals. Extant literature has demonstrated that open access publishing ensures greater access to research publications which promote citations and research impact of authors, institutions and journals (see Lawrence, 2001; Hajjem, Harnad and Gingras, 2005; Xia, 2010). Another interesting development is the acceptance of open access publishing by granting bodies and institutions as reported by Bjork and Solomon (2012), thus removing some factors which discourage open access publishing.

The position of African libraries and librarians is another source of concern in open access environment in the region. From the findings, there is concern about the policy thrust of African libraries in the development of institutional repositories. Ezema (2013) identified relevant local content materials which need to be digitised for the development of open access repositories. However, from the findings of the present study, it is obvious that very few

academic libraries in Africa have begun such digitisation projects. Though funding and technological support have been major constraints for the development of institutional repositories, African university libraries need to seek funding opportunities from their parent institutions, and also explore opportunities from private organisations within and outside Africa. Various national library associations and the International Federation of Library Associations (IFLA) –Africa section, need to develop an OA framework for African libraries.

OA movement is one change agent that cannot be wished away because the main philosophy behind it is to ensure free availability of research literature to the international scholarly community. Fortunately, it affords good opportunities for developing countries that lack access to research literature due to subscription barriers. Open access has come not only to mitigate these developmental challenges but also to localise and globalise scientific information for democratisation of scholarship globally. Africa cannot afford to miss this opportunity.

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Utilisation of Institutional Repositories for Searching Information Sources, Self-Archiving and Preservation of Research Publications in Selected Nigerian Universities

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Abstract

This study surveyed the use of institutional repositories (IRs) for searching information resources, self-archiving and preservation of research publications of academics in five Nigerian universities. The descriptive survey research method was adopted for the study. The population consisted of 491 academics and five repository librarians from the five universities that have their IR in Open DOAR. Questionnaire and interview were used for data collection. Data collected from the questionnaire were analysed using percentages. The findings showed that the most archived documents were journal articles. The information contents were utilised to a large extent; the submission of content for archiving on IR was very low; journal articles, conference/ seminar papers were the materials mostly submitted for archiving in IR. The implication of the study is that since the academics utilise the content of IR to a large extent but the rate of their submission is very low, there is need for sensitisation and creating awareness on the importance and use of IR.

Keywords: Institutional Repositories, Self-Archiving, Preservation, Information Resources, Research

Introduction

Institutional Repository (IR) is an online platform for preserving and disseminating the intellectual output of an institution. Such intellectual output includes journals, theses, dissertations, administrative documents, course notes, etc. IR promotes electronic publishing, enhances indexing of documents, preserves digital materials for the long-term, and provides global access to information (Sivakumaren and Jeyapragash, 2007). Akintunde (2010) further described an institutional repository as an online store for collecting, preserving and disseminating the intellectual output of an institution in digital form.

Self-archiving of the content by authors is a way to ensure self-sustainability and continuous populating of an IR. Most institutions encourage self-archiving because it helps to create awareness and provide appropriate metadata for easy access and retrieval. Self-archiving is defined by Swan (2005) as authors archiving copies of their articles in open access repositories themselves. The author highlighted that it is not an alternative to publishing in learned journals. Academics can archive their publications through self-archiving. Self-archiving is a sustainable way of ensuring that an IR is constantly updated and quality materials are uploaded. Self-archiving also encourages the creation of appropriate metadata for the contents. In a case where an author does not have permission to self-archive the publishers own file (the PDF version), the final draft of the work can be archived by the author. The willingness of academics to use an IR as a platform to archive their

research output, collaborate with colleagues and provide access to their research output is necessary for the sustainability of an IR.

Access to information resources is important because it helps information seekers to know the resources available, especially when they are made public. Christian (2008) is of the opinion that if users are ignorant of what is published, they will continue to 'reinvent the wheel' because they are unaware of research already conducted in their subject areas. Asamoah-Hassan (2010) stated: "anything that prevents access to, or free flow of knowledge is a threat to humanity, because it will hinder innovation, the creation and dissemination of the latest scientific and technical information." Accessing an IR promotes its utilisation, which enhances the visibility of research output and provides a global network for academic scholarship. Noh (2012) opined that investment in e-resources and in university libraries will enhance academic research achievement. Some libraries rely solely on subscription to online databases, paying less attention to creating databases of research outputs produced within the institution.

An IR is a platform which libraries adopt for managing research outputs for easy accessibility and to support teaching, learning and research. It is therefore important that academics are involved both in archiving and in using the resources as this will help to ensure standards and quality of the contents archived. It was based on this fact that this study was carried out to determine the academics' use of institutional repository for accessing information resources and as a platform for preservation of their research publications in selected universities.

Research Questions

The following research questions were formulated to guide the study.

i. What are the most common materials academics submit for archiving in institutional repositories in Nigerian universities?

ii. To what extent do academics use the content of an IR?

iii. What benefits are derived from using institutional repositories in Nigerian universities?

Literature Review

Accessibility of the content of institutional repository entails making the contents searchable and visible for information users to read and download. Accessibility of the contents enhances utilisation, which involves using IR as a platform to archive and preserve articles or research materials for easy accessibility and use. It also involves downloading the contents and using them for teaching and research. Ochogwu (1992) opined that "availability of resources is not coterminous with accessibility to resources, even when these resources are available empirical evidence has shown that it does not necessarily guarantee having access to such resources." An information resource may be available and users are not aware of it because no access points were provided for it. For material to be accessible, it should be indexed with terms that users can easily identify with the documents. That is why knowledge of the subject area of the materials is important to ensure that proper subjects/index terms are assigned to the materials.

Providing access to the intellectual products generated by the institution increases awareness of research contributions (Johnson, 2002). The IR system must be able to support interoperability and have a standard metadata in order to provide access through multiple search engines. An IR provides detailed information of research done in different subject areas in an institution in order to avoid duplication of research. Hixson (2011) stressed that capturing the wealth of literature or research output produced or needed by academics is a unique service that many libraries should provide through institutional repositories.

Despite the requirement for IR to support open access, decisions need to be made on the categories of content to be restricted (Genoni, 2004). Such documents, according to Genoni, may include draft documents that are available in a later or complete version; contents that might have temporary copyright restrictions; and items that may have restricted access due to the fact that they may cause offence or affect cultural sensitivity. The use of information has permeated all segments of human endeavours (Aliyu, 2010). Since IR is globally accessible and contains scholarly works, it becomes very useful to researchers because it contains original research works.

When research works or publications are published and archived in an IR, they are accessed by researchers, and this enhances the authors' visibility and citations, as well as ranking of the institution. The researcher, on the other hand, uses the materials for his research and development, as well as collaboration with colleagues. The result of their collaboration is the research output, which is archived on the IR for others to access.

Self-Archiving and Preservation of Research Publications

Self-archiving is important in building an IR to ensure sustainability, and long-term preservation of research output. Erturk and Sengul, cited in Ebrahim et al, (2014) defined author self-archiving "as storing the scientific research outputs in researchers' own web or institutional repository." The authors further stated that in self-archiving, authors can add additional information related to the published article. Support from faculty members is essential to ensure that the IR enhances the sharing of scholarly materials and for long-term digital preservation of the works (Betz and Hall, 2015). According to Grundmann (2009), faculty support open access but it is held back by the perception that self-archiving of their publication creates extra work for them.

It has been well documented that repository managers work hard to ensure that academics self-archive their works (Davis and Connolly, cited in Betz and Hall, 2015). Most times, academics find the process of self-archiving their publications difficult because they need to provide the metadata, check the copyright agreement and file format. These are procedures that are laborious for them and discourage them from self-archiving (Betz and Hall 2015). Self-archiving of articles immensely improves the visibility and citation impact of the articles (Ebrahim et al. 2014). According to Joint (2006), librarians' mediating deposit rather than pure self-archiving is the future of building institutional repositories. The author further stated that libraries and librarians are well placed to give input to the metadata and digital preservation activities inherent in building an institutional repository. Grundmann (2009) suggested that the challenge of academics being held back from self-archiving can be tackled by making self-archiving as easy as possible. Abrizah, cited in Abrizah et al. (2010) observed that self-archiving is still seen as a major concern among authors. Self-archiving helps to ensure the authenticity of the works archived in IR, and the creation of appropriate subject terms for the articles for easy accessibility. Most times, works may be online but the proper subject (metadata) that will enable retrieval may not be assigned to it, and this makes such works inaccessible. Self-archiving by faculty members enhances the sustainability of IR. Thus, it is important to work with faculty members for successful implementation of the IR.

Research dissemination is a core mission for all universities (Armstrong, 2014). Thus, preservation of research output for posterity and visibility is the main focus of many institutions such that many institutions in developed countries have gone far in digitising and uploading their research outputs. However, the case is different for developing countries. Manjunatha and Thandavamoorthy (2011) opined that the unwillingness of authors to submit their publications was as a result of lack of information, and not being aware of what to deposit. Some are afraid that other people will copy their work without permission. Akpokodje and Akpokodje (2015) in their study, found that although 50 academics out of 51 academics that responded to the questionnaire have published from 0-2 articles and above 9 articles, majority of the respondents (47 academics) did not have their articles in the IR. In another study, Bamigbola (2014) discovered that only 7.8% of faculty had submitted their scholarly works in their university IR and had searched it as information source; 58.8% had not submitted but had searched it as information source; while 33.4% had neither submitted their scholarly publications nor searched the IR. This low participation, the author highlighted, has been of great concern because it has not allowed the potential benefits of IR to be achieved. Akpokodje and Akpokodje (2015) identified a number of factors contributing to the low use of IR to include lack of interest, lack of equipment to scan and upload documents, inaccessibility of servers, lack of technical knowhow, frustrating internet service, fear of plagiarism and ignorance of the existence of IR and its functionalities.

Digital publishing expands the number of research that can be made available for review. Thus, institutional repository is an avenue for more

researchers to register their works in a reorganised and more accessible medium (Crow, 2002). Chen and Hisang (2009) stated that "open access institutional repositories can disseminate scholarly information of universities and research institutes in an efficient way. They will also reinforce, influence and magnify the reputation of universities and research institutes." The authors added that IR system is the appropriate platform to preserve research output, record research history, and provide access to research reports.

Benefits of Utilising Institutional Repository

One of the benefits of using institutional repository is for the promotion of research and development. Sivakumaren and Jeyapragash (2007) highlighted the benefits of institutional repository as dissemination of information, storing of learning materials and coursework, promotion of electronic publishing, management of the collections of research documents, preservation of digital materials, exhibition of the academic activities of an institution, and promotion of leadership role for the library. Armstrong (2014) opined that IR service is a core component for fulfilling an important university mission. This mission comprises teaching, learning, and research. IR is very useful in disseminating research outputs from institutions to users because it is searchable and enhances metadata harvesting by other search engines. Momin and Gaonkar (2016) stated that IR helps to organise the intellectual output of an academic in one place; creates a knowledge bank; improves the visibility of the institutions, and provides global access to the enduring heritage of an institution.

For authors and readers, the IR promotes open access (OA) of information (Pinfield, 2005). For authors, it lowers access barriers and disseminates research quickly. For readers, access is also quick and easy from their desktop via common search tools or even from some repositories' email alerts. Furthermore, according to Harnad (2003), if such open access archiving were mandatory, further benefits to institutions would accrue, such as keeping track of research output, research reporting, and eventual online global access to all researches.

Open access IR is an important platform for universities and faculties to archive their works in order to make them searchable, readable and accessible. Writing on the significant benefits of institutional repository, Arif and Kanwal (2009) stated that it stores resources in digital format, which allows for easy access by online users at multiple sites around the globe. Besides that, Crow (2002) noted that IR enhances the professional visibility of authors and also serve as a resource supporting classroom teaching. Further, Campbell, Blinco and Mason (2004) opined that institutional repository facilitates more efficient storage and management of resource. It enables users to share their resources and to discover resources shared by others.

Tate (2010) stated that global visibility and an increase in the citation of the universities' scholarship are the common benefits of using an IR. Researchers can be better known and connected to the global network through their publications. Markey, Rieh, Yakel, St. Jean, and Kim (2007) identified the major benefits of IR as "capturing the intellectual output of the institutions, providing better services to contributors, exposing the institutions' intellectual output to researchers around the world, increasing the library's role as a viable partner in research enterprise, providing long-term preservation of institutions' digital output, providing better services to the institutions' learning community, and providing solution to the preservation of the institutions' intellectual output."

Research Methodology

The study adopted a descriptive survey research design. The population of the study consisted of five repository librarians from the five selected universities in Nigeria that have institutional repositories. From the information gathered from the Directory of Open Access Repository (OpenDOAR), out of the one hundred and twenty-six universities in the country, five universities had institutional repositories that were available on OpenDOAR database. The universities are: University of Jos, (UNIJOS); Covenant University (CU), Otta; University of Nigeria, Nsukka, (UNN); Federal University of Technology, Akure; (FUTA), and Ahmadu Bello University (ABU), Zaria (OpenDOAR, 2013).

The sample size for the study was made up of five repository librarians in charge of institutional

repository projects from each of the five institutions and 491 academics. The population of academics in the universities is as follows: University of Jos, (UNIJOS), 950; Covenant University Otta, (CU), 400; University of Nigeria, Nsukka (UNN), 1515; Federal University of Technology, Akure (FUTA), 635 and Ahmadu Bello University Zaria (ABU), 1405 academics (OpenDOAR, 2013).

The researcher used multi-stage sampling to arrive at the number of respondents for academics. The first stage was purposive sampling technique to select the universities that had their IR available in OpenDOAR. The total number of academics in the five universitesat the time of study was 4,906.

At the next stage, the researcher used a proportionate stratified sampling technique to select 10% of the total population of academics in each faculty to arrive at the sample size of 491. The researcher based the sample on Gall, Gall and Borg (2007) who state that where a population is in the range of 2000 to 5000, 10% of the population can be used for a study. Using the principle of representation, the sample size for each university was as follows: UNIJOS (95), UNN (151); FUTA (64); Covenant (41) and ABU (140), giving a total of 491. This comprised academics in different categories (senior and junior) from different faculties, with varied research interest and publishing guidelines.

Questionnaire and interview schedules were the instruments used for data collection. The questionnaire was administered to academic staff while the interview was administered to the repository librarians. The data collected was analysed using percentages for the research questions. The interview responses were analysed qualitatively.

Results and Discussion

Out of 491 copies of questionnaire that were distributed, 415 (84%) were returned, while 369 (75%) were found usable for the study. Some copies of the questionnaire, 46 (9%), were not used for the study, because they did not indicate their ranks and in some questionnaire, the questions were not completed.

Table 1: Questionnaire Distribution and Return Rate

S/N	Institution	No Distributed	No Returned	No properly filled	% of Usable questionnaire
	University of Nigeria	151	143	133	88.1
	Ahmadu Bello University, Zaria	140	115	105	75
	University of Jos	95	75	70	73.6
	Federal University of Technology, Akure	64	48	35	54.6
	Covenant University, Otta	41	33	25	60.9
	Total	**491**	**415**	**369**	**75%**

Research Question 1: What materials do academics submit most for archiving in IR in the selected Nigerian Universities?

The number of submission of publications by academics for archiving is shown in Figure 1. The figure shows the number of publications submitted by academics in each of the universities on each item. The data was gathered from the academics, as indicated on the questionnaire. The respondents indicated the publications submitted, based on the intervals indicated (e.g. 1-5). The analysis was done item by item for each university, based on the number of publications submitted.

The result as presented in figure 1 shows that a majority of academics from the institutions studied had not submitted many of their publications for archiving. Some respondents that had not submitted their publications for archiving indicated the reasons for not submitting their publications to include: they had not been able to put their papers together; some of the academics did not know that they were expected to do so (lack of awareness); and some of the academics were not aware of any known avenues

or channels for doing so. Some academics argued that the institutions did not support their publications and therefore would not make their publications available for archiving. Others were scared of violating copyright and intellectual property laws, while others cited poor internet facilities. On the other hand, some of them seemed not to have publications to submit, especially the junior academics. During interview with the repository librarians, they responded that content submission was one of the major challenges as many academics found it difficult to submit their publications.

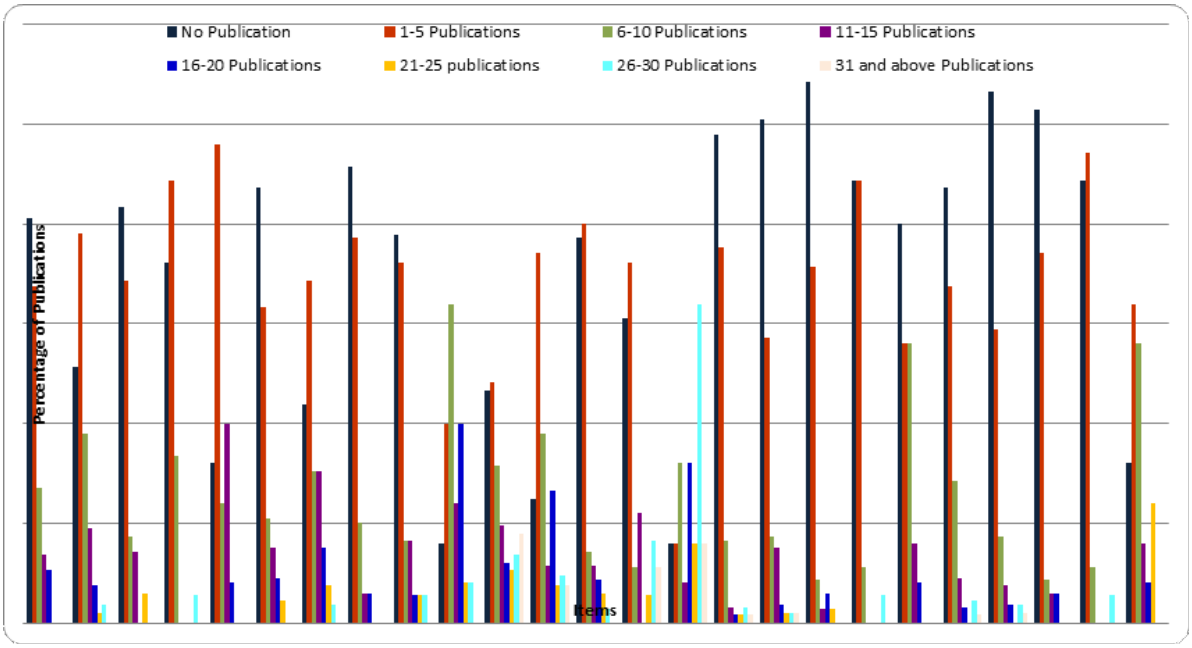

Figure 1: Number of Academics that have Submitted their Publications from each University for Archiving in the Institutional Repository

Information materials that were archived in the institutional repositories are shown in Figures 2 to 6.

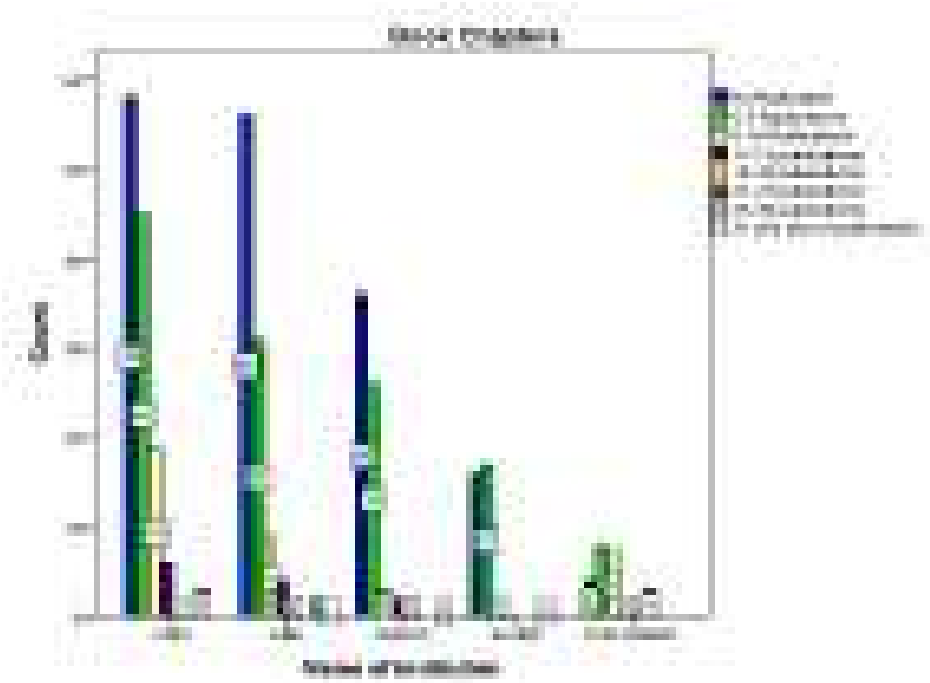

Figure 2 Book Chapter- Number of academics from each University

The breakdown shows that most of the academics at the UNN (58 or 43.6%) had not submitted their publications for archiving. Similar results were obtained for: ABU (56 or 53.3 %), UNIJOS (36 or 51.4%). At FUTA, a minority, (16 or 45.7 %) indicated that they had not submitted their publications for archiving. However, at CU, only (4 or 16%) did not submit their publications for archiving. A substantial majority of the academics had submitted their publications at Covenant University.

At UNN, 75 academics out of 133 (56.4 %) submitted between 1 and 31 and above of their book chapters for archiving. At ABU, 48 academics out of 105 (45.7%) submitted book chapters for archiving. In UNIJOS, 33 academics out of 70 (47.1%) submitted book chapters for archiving. At FUTA, 19 academics out of 35 (54.3%) submitted book chapters, while at CU, 21 academics out of 25 (84%) had submitted book chapters for archiving. Based on the number of academics that responded to the questionnaire in each university, academics from Covenant University submitted more than academics from other universities.

The results in Figure 3 show that in UNN, 65 or 48.9% of the academics had not submitted any book for archiving. Similar results were obtained for other universities: ABU 53 (50.5%); UNIJOS 38 (54.3%); FUTA 16 (45.7%); and Covenant 10 (40%). Thus, 68 academics out of 133 from UNN (51.1%)had submitted between 1 and 31 and above of their books for archiving; 52 academics out of 105, from ABU (49.5%) had submitted between 1 and 31 and above books for archiving; 32 academics out of 70 (45.7%) from UNIJOS had submitted 1 and 31 and above books for archiving; 19 academics out of 35 (54.3%)from FUTA submitted between 1 and 31 and above books for archiving; while 15 academics out of 25 (60%)from Covenant had submitted between 1 and 31 and above. The study reveals that majority academics at Covenant University submitted the highest proportion of their publications, followed by FUTA and UNN in that order.

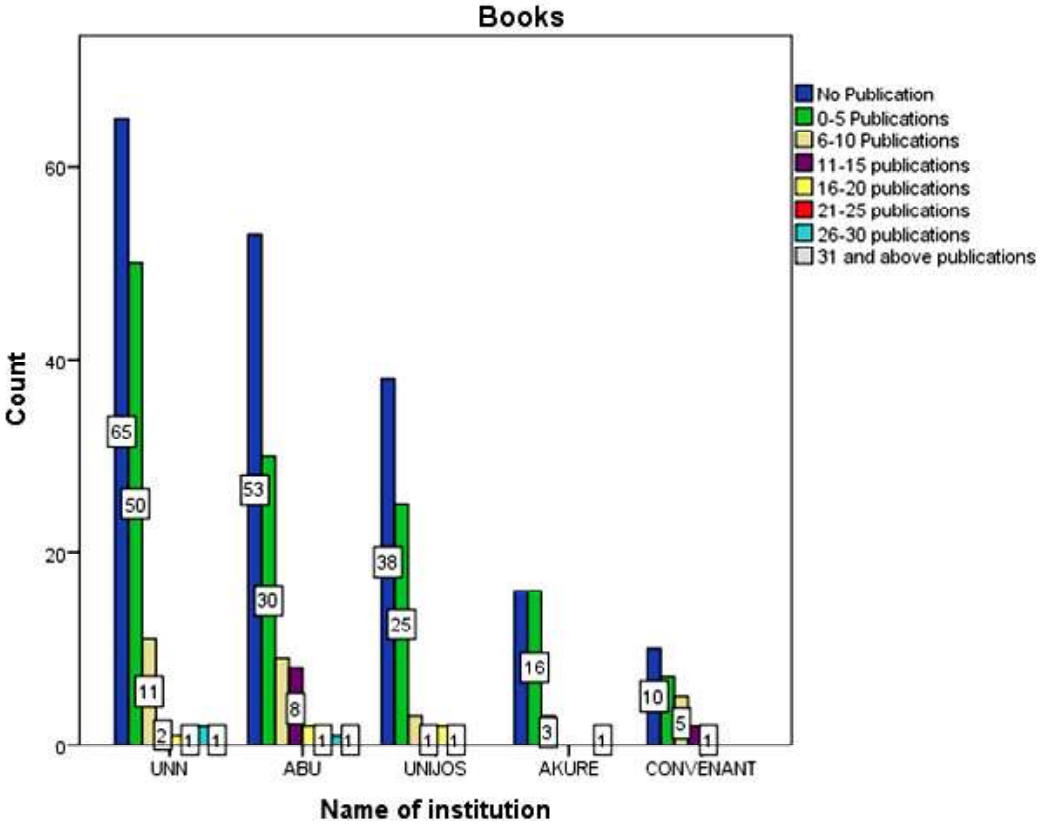

Figure 3: Number of Academics that have submitted their Books for Archiving

For Journal articles as shown in Figure 4, UNN (31or 23.3%); ABU (13 or 12.4%); UNIJOS (27 or 38.6 %); FUTA (11 or 31.4%); and CU (2 or 8 %) had not submitted their journal articles for archving. In summary, 102 out of 133 academics (76.7%) from UNN submitted between 1 and 31 and above journal articles for archiving; 92 out of 105 (87.6%) academics from ABU submitted between 1 and 31 and above journal article for archiving; 43 out of 70 (61.4%) academics from UNIJOS; submitted between 1 and 31 and above journal articles for archiving. At FUTA, 24 out of 35 (68.6%) academics had submitted journal articles, while 23 out of 25 (92%) academics in Covenant submitted journal articles for archiving. Therefore, academics from Covenant submitted more than other universities followed closely were ABU and UNN.

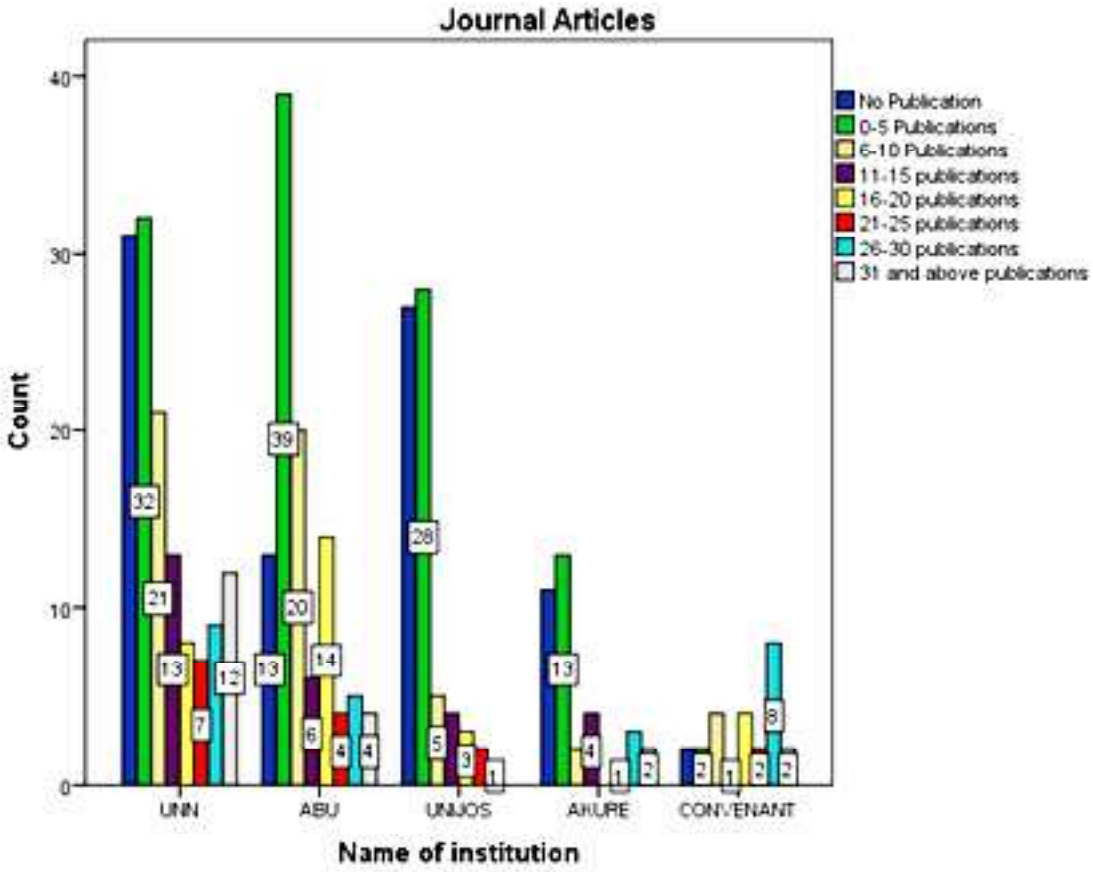

Figure 4: Number of Academics that have Submitted Journal Articles in each University

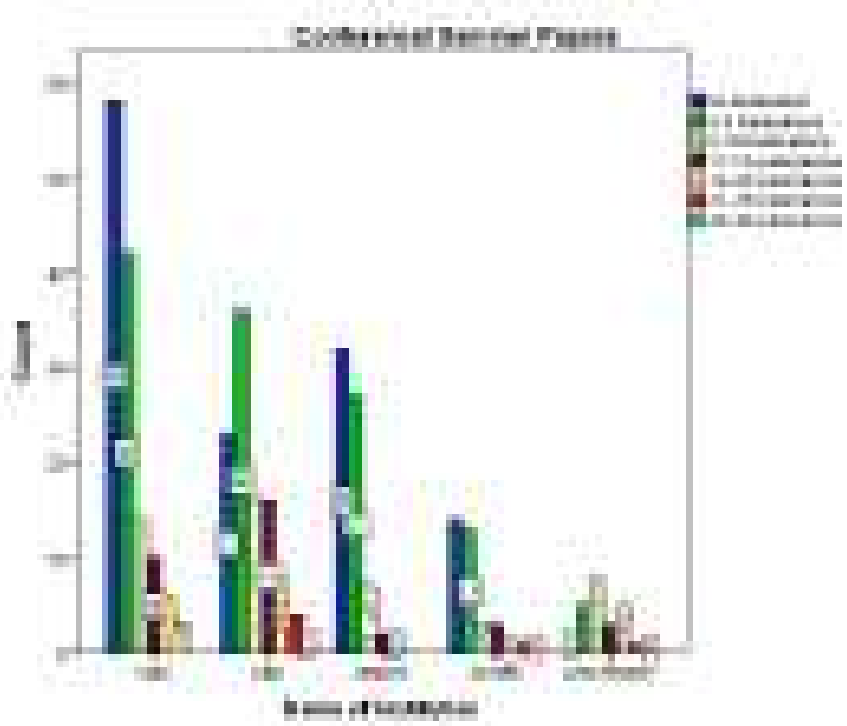

Figure 5: Number of Academics that have Submitted Conference/Seminar Papers

Figure 5 shows that 82 out of 105 (78%) academics from ABU had submitted between 1 and 31 and above of their conference/seminar papers for archiving, followed by UNN (75) out of 133 (56.4 %) academics; UNIJOS 38 out of 70 (54.3%) academics; Covenant 23 out of 25 (92%) academics and FUTA 22 out of 35 (62.9%) academics. Academics from CU submitted more conference/ seminar papers, followed by ABU and FUTA.

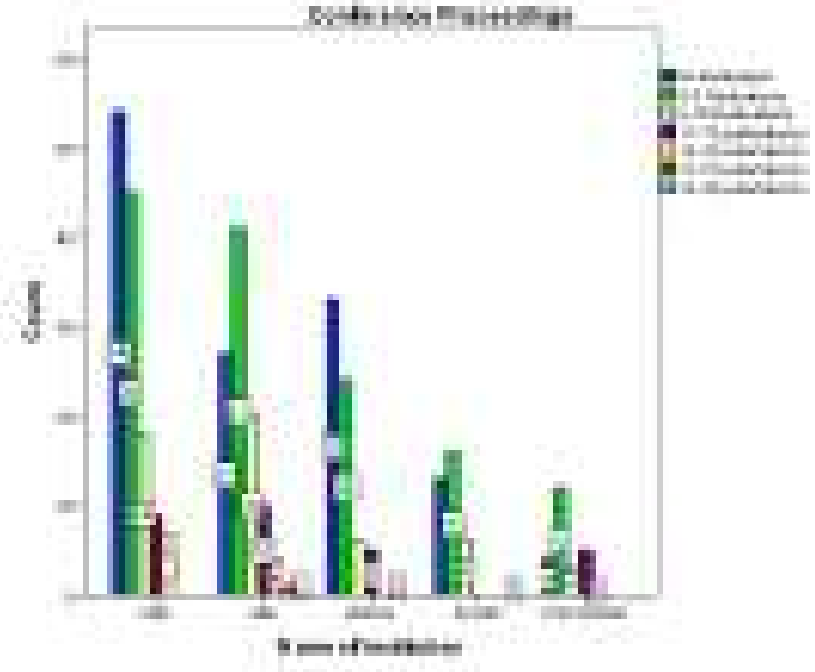

Figure 6: Number of Academics that have Submitted Conference Proceedings Based on Universities

For conference proceedings, 79 out of 133 (59.4%) academics submitted conference proceedings for archiving; 78 out of 105 (74.3%) academics from ABU submitted conference proceedings; 37 academics out of 70 (52.9%) submitted for archiving; 23 academics out of 35 (65.7%) had submitted conference proceedings for archiving; while 21 academics out of 25 (84%) have submitted conference proceedings. Academics from Covenant University submitted more conference proceedings; followed by ABU and FUTA.

Table 2: Volume of Content Archived in Institutional Repository Based on Universities and Types of Resources

Local contents	UNN	ABU	UNIJOS	FUTA	COVENANT
Conference proceedings	602	0	0	400	0
Conference/ seminar papers	60	0	0	400	0
Journal articles	4,000	0	661	0	1,232
Books	156	0	0	0	45
Book chapters	118	0	0	0	0

Table 2 shows that UNN staff archived 602 conference proceedings, 60 conference/seminar papers, 4000 journal articles, 156 books and 118 book chapters titles. At ABU, they had not archived any of these contents; UNIJOS 661 journal articles had been archived; FUTA 400 conference proceedings and 400 conference/seminar papers had been archived. CU had 1,232 journal articles and 45 books had been archived. The response from the interview conducted with the repository managers showed that ABU archived theses and dissertations first, and will continue with other materials. FUTA archived materials that they did not have to get copyright permission for, while CU, UNIJOS and UNN archived all the different types of publications studied. Generally, on the use of IR for archiving academic publications; the number of submission of publications by academics was very low. This in line with the study of Akpokodje and Akpokodje (2015), where 50 academics out of 51 academic staff submitted between 0 and 2 articles and 9 above. In the study of Bamigbola (2014), very few (7.8%) have also submitted. their scholarly works in their university IR and had searched it for information sources.' Further breakdown of Figure 2 (figures 2 -6) on the rate of academics submission based on universities and types of resources, academics from Covenant University submitted more contents for archiving in their repository than other universities. On the type of materials that are submitted mostly by academics, journal articles ranked highest, followed by conference/seminar papers. A close look at Table 2 shows that even though the academics submitted these publications, they were not all available on the website. One would have expected the academics to use the repository platform to promote their visibility by archiving their publications, but the reverse is the case. The study of Byrd (1999) stated that there existed a relationship between the use of journal literature and the publishing productivity of academics in the Faculty of Medicine. This view also reflects in the finding of the study on the contents academics use and the types they submit for the IR. Therefore, journal articles and conference/seminar papers were the most submitted content for archiving.

Findings on the extent of use of the content of institutional repository by academics for research show that journal articles are used by the academics to a large extent. The findings of Olanlokun, cited in Popoola and Haliso (2009), showed that journal articles, textbooks, theses and dissertations monographs are important to academics in Nigerian universities. In this study, it was discovered that academics use journals to a large extent.

During the interview schedule, it was also discovered from the repository librarians that archiving the research publications on IR had improved service delivery; enhanced preservation of the university publications, and provided easy access to these important resources. In addition, Covenant University repository librarian stated that the library had been able to provide 24 hours service for researchers both within and outside their institution. Also, in UNIJOS, the IR librarian pointed out that archiving of staff publications had promoted the research of works of their academics.

The result on the benefits derived from using IR showed that there are lots of benefits from using IR. The findings of this study corroborate the findings of McGill (2010) and Harnad (2003) that IR keeps track of research publications, gives global access to research and increases readership (citation). Pinfield (2005), on the other hand, stated that it lowers access barrier.

The implication of the findings is that it is beneficial to use institutional repository to manage institutional resources because it can help to provide global access to resources and improved library services. Users can also access the materials anytime, irrespective of their location. Again, users have access to more information; and also, one document can be used by several users at the same time. This result is in consonance with the study of Rieh; Markey; Yakel; St. Jean; and Kim (2007) that IR captures intellectual output of the institution; visibility of the institution; preservation of the institutions' output, and improves service to the institution. The interview with UNIJOS repository librarian reveals that patrons from within and outside the UNIJOS community had been accessing the IR. At UNN, it was reported that IR had improved services in terms of access and visibility of their research publications globally. CU Repository Manager reported that IR had helped to provide more access to content, and people made use of the content of IR more than print resources. At FUTA, it was reported that IR had improved services to users.

Conclusions and Recommendations

This study has evaluated the use of institutional repositories in Nigerian universities and the extent of utilisation. The study concludes that the number of submissions made by academics was very low, UNN academics submitted more of their publications for archiving, followed by ABU. The resources that were mostly submitted were journal articles, conference and seminar papers. The study also discovered that there are a lot of benefits derivable from using an IR, such as improved visibility and collaboration. More awareness and enlightenment programmes are important to sensitise the academics and the university community on the benefits of IR. Based on the findings of the study, the following recommendations were made:

- Provision of adequate infrastructure is important for IR development facilities; such as power and broadband width are necessary for the project. It will be frustrating for academics to submit or archive their publications or even access the archived works where facilities (such as internet access; power supply) are not available.
- Sensitisation and awareness programmes should be conducted by the university community on the existence and the use of IR in universities for research and preservation. In this way, the academics will be aware that it is important to submit their content for archiving. They will also know that their published works can be linked to the repository if they request that from the publisher.
- There should be more advocacy and marketing of academic publication by the librarians and university community using IR platform so that many will be motivated to use the IR for accessing information resources and for self-archiving of their research publications.

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Trend of African Scientific Output and Impact 1996 – 2015

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Abstract

It is important to analyse the scientific performance of nations to help evaluate the effectiveness of current policies and to aid future planning. In response, this article reports a trend analysis of the number of Scopus-indexed publications and their average impact for 48 African countries 1996-2015, using fractional authorship counting and field normalised log citation rates, relative to the world average. The results show an encouraging and almost universal trend for African countries to increase their share of the world's output during this period, but most also experienced a decrease in their citation impact relative to the world average. The decline in relative citation impact is not an immediate cause for concern since it may be a by-product of increasing research capacity reducing the reliance upon international collaboration. Thus, African policymakers should be broadly satisfied with their efforts so far, but should be aware of the long-term need to reverse the declining trend in average research impact.

Keywords: African Science, Scientometrics, Citation Analysis, Longitudinal Analysis

Introduction

National governments spend substantial amounts of money on academic research, either directly in the form of research-only organisations or research-funding schemes, or indirectly in the form of higher education finance that is expected to include an element of research. Scholarly achievements are expected to have many societal benefits from helping the education system to improving national competitiveness and quality of life. Because of the vast amount of public money spent on research, it is important to monitor the progress of a country's researchers to inform future policy-making and planning. Research spending in Africa lags the rest of the world (Confraria and Godinho, 2015) and seems to be predominantly channelled through higher education in most countries. Research in Africa tends to specialise in health issues (e.g., tropical medicine) and in topics related to the exploitation of natural resources rather than covering all academic topics (Pouris and Ho, 2014). Because of this, Africa makes few published academic contributions to some areas, such as music and philosophy within the arts and humanities, at least in terms of journal articles.

Collaboration is important for African research published in international scientific indexes, and particularly with the United States of America (USA), the United Kingdom (UK) and France (Confraria and Godinho, 2015). For example, within Central Africa, the legacy of colonialism still affects research, with academics tending to collaborate with researchers in the former colonising countries (35% of all output in Central Africa). In Central Africa, almost all published research in the Web of Science is produced through international collaboration (85%) (Boshoff, 2009; see also: Ettarh, 2016; Mêgnigbêto, 2013b), and the proportion of international collaboration may be increasing in some African countries (Sooryamoorthy, 2010). African nations may even adapt their research practices to improve their chances of attracting international collaborations and funding (Moyi Okwaro and Geissler, 2015). A later study of West Africa confirmed the numerical dominance of collaborations with non-African countries – mainly UK, USA and France (Mêgnigbêto, 2013a). Internal collaboration patterns

in African research fall into three groups – Northern, South-Eastern and South-Western that tend to collaborate with each other more than with other African countries (Toivanen and Ponomariov, 2011).

An analysis of African articles in the Web of Science 1981-2011 reveals that Africa started to increase steadily its share of the world's publications from about the year 2000. Also that a few countries (Mozambique, Zambia, Mali, Tanzania, Uganda, Malawi, Kenya) published research that had impact above the world average (Confraria and Godinho, 2015). But the citation indicator used has since been replaced in the bibliometric community for being inadequate (Waltman, van Eck, van Leeuwen, Visser, and van Raan, 2011), and so these findings are not robust.

There have been several bibliometric studies of aspects of African research. These include an investigation of South African universities (Jacobs, 2006), sections of a book on the same topic (Sooryamoorthy, 2015) as well as many studies of individual research topics or broad fields (Molatudi, Molotja, and Pouris, 2009; Uthman and Uthman, 2007), and individual universities (Ocholla, Mostert, and Rotich, 2016). One study analysed scientific output in Africa 2000–2004 (academic publications and patents) but no changes over time (Pouris and Pouris, 2008). An investigation of African scientific productivity 1996–2009 reported the proportion of the world's articles in Scopus for 26 countries and years as well as their relative impact although relative impact is not defined (Arencibia-Jorge, 2012). The current paper extends this report by adding the years 2010-2015, using a new relative citation indicator that is not unduly affected by the skewed nature of citations (see the methods section below), and considering additional 22 countries. This allows previous findings to be checked and updated. as well as allowing countries with a lower level of scientific productivity to be checked.

Research Questions

The research questions are mainly descriptive, with the first two assessing changes in the two main measurable dimensions of research output: quantity and average impact.

- **RQ1**: How have African countries' shares of the world's publications changed since 1996?
- **RQ2**: How have African countries' citation impacts changed relative to the world average since 1996?
- **RQ3**: Is there evidence that African nations with low academic output tend to produce low quality research?

Methods

The research design was to use a large sample of the world's articles 1996 –2015 and used publication counts and field normalised citation indicators to identify changes in publication share (i.e., the number of publications relative to the world) and average citation impact relative to the world over time.

Out of the two major citation databases, Scopus was selected as the data source for its broader international coverage than the Web of Science (Li, Burnham, Lemley, and Britton, 2010; López-Illescas, de Moya-Anegón and Moed, 2008; Moed and Visser, 2008). The coverage of Scopus is much smaller before 1996, so, this year was chosen as the starting point. The end point of 2015 was chosen to allow at least a year for (almost) all articles to attract citations.

Scopus categorises academic journals into broad and narrow subject categories. A sample of narrow categories was chosen for the analysis. To generate a systematic sample, the seventh narrow subject category within each Scopus broad subject category was chosen, replacing the seventh category with another in cases when there were less than seven. After excluding one small category that only had results after 2006 (Dental Assisting) and adding an extra category for one large broad field. The selected categories were: Applied Microbiology and Biotechnology; Atomic and Molecular Physics, and Optics; Cell Biology; Computer Vision and Pattern Recognition; Control and Systems Engineering; Dermatology; Discrete Mathematics and Combinatorics; Emergency Nursing; Endocrine and Autonomic Systems; Finance; Fluid Flow and Transfer Processes; Forestry; Fuel Technology; Geology; Health, Toxicology and Mutagenesis; History and Philosophy of Science; Human Factors and Ergonomics; Medical Laboratory Technology; Organizational Behaviour and Human Resource Management; Pharmaceutical Science; Polymers and Plastics; Small Animals; Social Psychology; Spectroscopy; Statistics, Probability and Uncertainty

and Transplantation. Scopus indexes various types of object, from conference papers to editorials. To ensure homogeneity of the data, only documents registered as journal articles in Scopus were included. Standard journal articles are the primary output type covered by Scopus, and are the most important documentary outputs of most areas of science, excluding the arts, humanities and some social sciences. They are therefore the logical choice for analysis.

The citation counts and author affiliations of all journal articles in the set were downloaded from Scopus during December 2016 and January 2017, using Scopus API queries such as the following for Forestry (subject code 1107) journal articles. A separate query was submitted for each year, including the year as a refinement parameter for the query.

Articles were assigned to countries using the fractional counting method: if a proportion *p* of an article's authors were from a given country, then *p* of the article and *p* of the articles' citations would be assigned to that country. In some cases, the Scopus records were incomplete because there were more authors than country affiliations or more country affiliations than authors. These incomplete records were excluded. This is a small percentage and mostly applies to highly co-authored articles; and so, because of the fractional counting scheme used, this should not affect the results much.

Raw citation counts are not useful for comparisons between countries or years because the average number of citations per paper varies greatly between fields and years. A field normalised citation indicator is therefore needed. The Mean Normalised Log Citation Score (MNLCS) (Thelwall, 2017ab) was chosen in preference to the more standard Mean Normalised Citation Score (MNCS) (Waltman, van Eck, van Leeuwen, Visser, and van Raan, 2011) to avoid being unduly influenced by individual highly cited articles. This is important because citation data is highly skewed (de Solla Price, 1976; Thelwall, 2016), and this is particularly problematic for the MNCS for the relatively small numbers here for individual years. The MNLCS is therefore a substantial improvement for African countries with low publication outputs. The MNLCS is calculated as follows:

- Replace the citation count *c* of each article by in $(1 + c)$. This log transformation reduces the skewing and prevents individual highly cited articles from having a major influence on the results.
- Calculate the average (arithmetic mean) $\overline{\ln(1+c)}$ of the $\ln(1 + c)$. values for all the world's articles, performing a separate calculation for each field and year. In the present data, this resulted in 26 x 20 = 520 calculations, one for each field and year.
- Divide all the log transformed citation counts by the world average for the field and year $\ln(1+c) / \overline{\ln(1+c)}$ to get the field and year normalised log-transformed citation count.
- Calculate the arithmetic mean of the field and year normalised log-transformed citation counts separately for each year and country (for the main graphs) and for each year, country and field (for field-graphs, shown only in the online supplement).

Results

As I has been previously shown, a few African countries produce most of Africa's papers, and many countries have a very low total research output (Table 1). This pattern holds when fractional counting is used, as in Table 1, and is not affected by the data source here, being only 26 out of the 310 Scopus categories.

Table 1: The 48 African countries recorded in Scopus for at least one of the years 1996–2015

Rank	Country	Articles	Africa %	World %
1	Egypt	11098.6	29.5%	0.43%
2	South Africa	9032.2	24.0%	0.35%
3	Nigeria	4160.7	11.0%	0.16%
4	Tunisia	3803.2	10.1%	0.15%
5	Algeria	2286.9	6.1%	0.09%
6	Morocco	2181.1	5.8%	0.08%
7	Kenya	706.9	1.9%	0.03%
8	Cameroon	539.5	1.4%	0.02%
9	Ethiopia	536.6	1.4%	0.02%
10	Ghana	453.3	1.2%	0.02%
11	Tanzania	316.8	0.8%	0.01%
12	Uganda	266.8	0.7%	0.01%
13	Zimbabwe	232.9	0.6%	0.01%
14	Senegal	232.5	0.6%	0.01%
15	Sudan	213.8	0.6%	0.01%
16	Botswana	200.9	0.5%	0.01%
17	Libya	180.7	0.5%	0.01%
18	Burkina Faso	163.8	0.4%	0.01%
19	Cote d'Ivoire	161.8	0.4%	0.01%
20	Benin	108.1	0.3%	0.00%
21	Malawi	100.1	0.3%	0.00%
22	Zambia	85.6	0.2%	0.00%
23	Madagascar	73.0	0.2%	0.00%
24	Namibia	62.7	0.2%	0.00%
25	Togo	60.5	0.2%	0.00%
26	Mozambique	56.1	0.1%	0.00%
27	Congo	54.2	0.1%	0.00%
28	Mali	48.3	0.1%	0.00%
29	Rwanda	42.3	0.1%	0.00%
30	Niger	31.9	0.1%	0.00%
31	Gabon	30.6	0.1%	0.00%
32	Democratic Republic, Congo	22.1	0.1%	0.00%
33	Eritrea	20.8	0.1%	0.00%
34	Gambia	18.9	0.1%	0.00%
35	Swaziland	16.2	0.0%	0.00%
36	Angola	12.7	0.0%	0.00%
37	Sierra Leone	11.0	0.0%	0.00%
38	Lesotho	10.1	0.0%	0.00%
39	Mauritania	8.9	0.0%	0.00%
40	Guinea	8.4	0.0%	0.00%
41	Chad	7.3	0.0%	0.00%
42	Burundi	7.0	0.0%	0.00%
43	Central African Republic	6.8	0.0%	0.00%
44	Djibouti	3.0	0.0%	0.00%
45	Guinea-Bissau	2.3	0.0%	0.00%
46	Liberia	2.1	0.0%	0.00%
47	Equatorial Guinea	1.7	0.0%	0.00%
48	Somalia	0.5	0.0%	0.00%
	Africa total	**37682**	**100.0%**	**1.45%**
	World total	**2605096**		**100%**

Articles are based on fractional counting and cover 26 out of 310 Scopus narrow subject categories.

The research questions can be answered from Figures 1-10.

RQ1: How have African countries' shares of the world's publications changed since 1996?

Share of the world's publications. Each of the top 10 countries increased their share of the world's Scopus-indexed publications, as can be seen from the Article line (% share of the world's articles) having an upward slope in Figures 1-10. The same is not true for all countries. However, two countries experienced a clear decrease: Zimbabwe and Botswana (since 2005), and there were too few publications to identify a trend for Swaziland and lower ranked countries in Table 1 (see the online supplement).

RQ2: How have African countries' citation impacts changed relative to the world average since 1996?

Changing relative citation impact (MLNCS). Seven out of the ten African countries producing the most research output experienced a decline in the citation impact of their research, compared to the rest of the world. In two cases, relative citation impact has remained constant (Tunisia, Algeria); and in one case, it increased (Kenya). For the additional countries in the online supplement, a similar decreasing trend was common, but Zimbabwe's and Burkina Faso's, Malawi's relative citation impacts stayed approximately constant. Congo's and Mali's increased, and patterns are hard to identify for Rwanda and lower ranked countries.

RQ3: Is there evidence that African nations with low academic output tend to produce low quality research?

Although in recent years, most countries have relative impact (MNLCS) below the world average of 1, countries that produce the fewest articles do not necessarily have the lowest citation impact (see the online supplement). For example, Tanzania (ranked 11) and Uganda (ranked 12) have MNLCS above the world average of 1 for most years (Figures A1, A2 in the online supplement). Moreover, all countries ranked 11–48 except Senegal, which has at least one year in which their citation impact is above the world average of 1 (Online supplement Figures A1-A38). Even Zimbabwe (ranked 12), with a rapidly declining share of the world's scientific outputs, has an MNLCS value close to 1 for most years covered (Figure A3 in the online supplement).

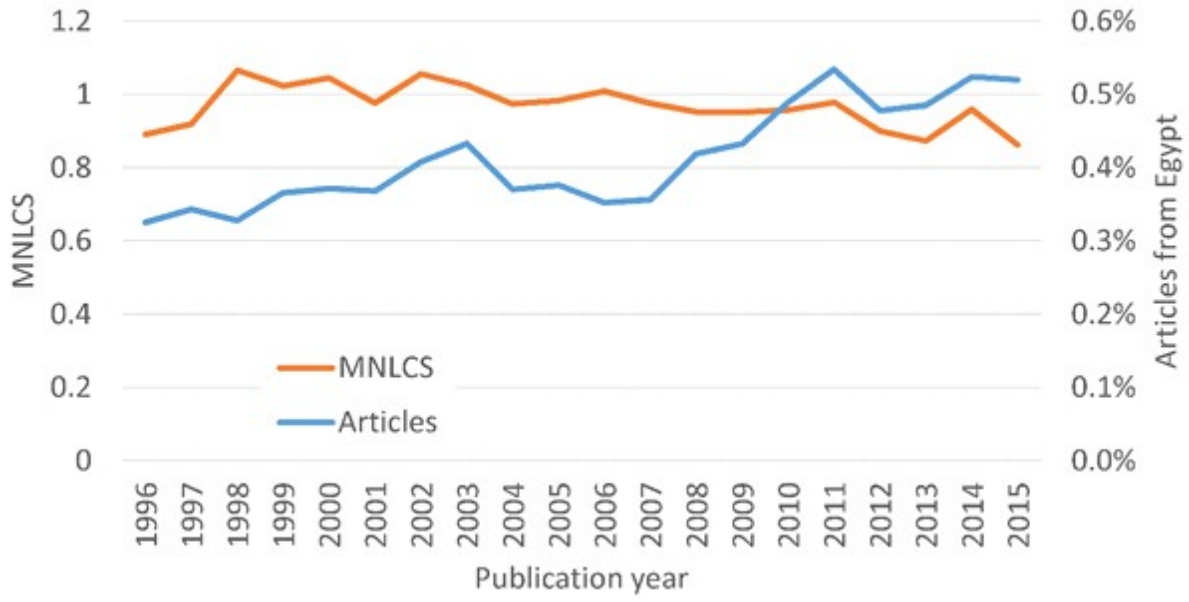

Figure 1: The Percentage Share of the World's Journal Articles

The relative citation rate for Egypt compared to the world average of 1 (left side y-axis and MNLCS line) based on Scopus data from 26 out of its 310 fields. The MNLCS value is normalised so that the world average is 1 for all years.

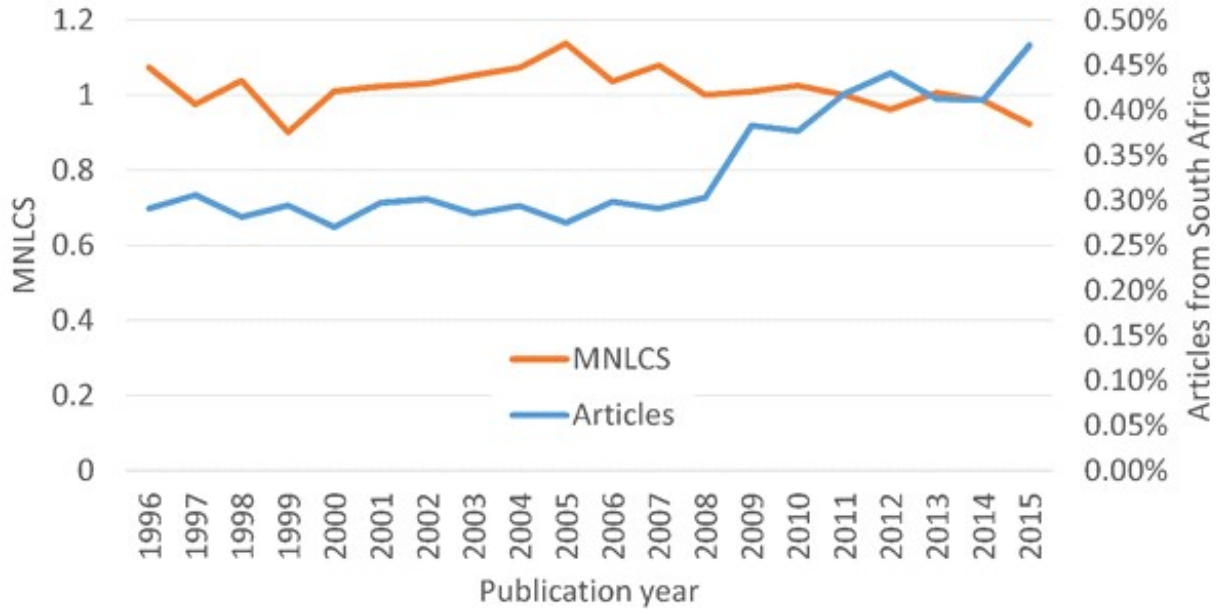

Figure 2: South Africa's Percentage Share of the World's Journal Articles

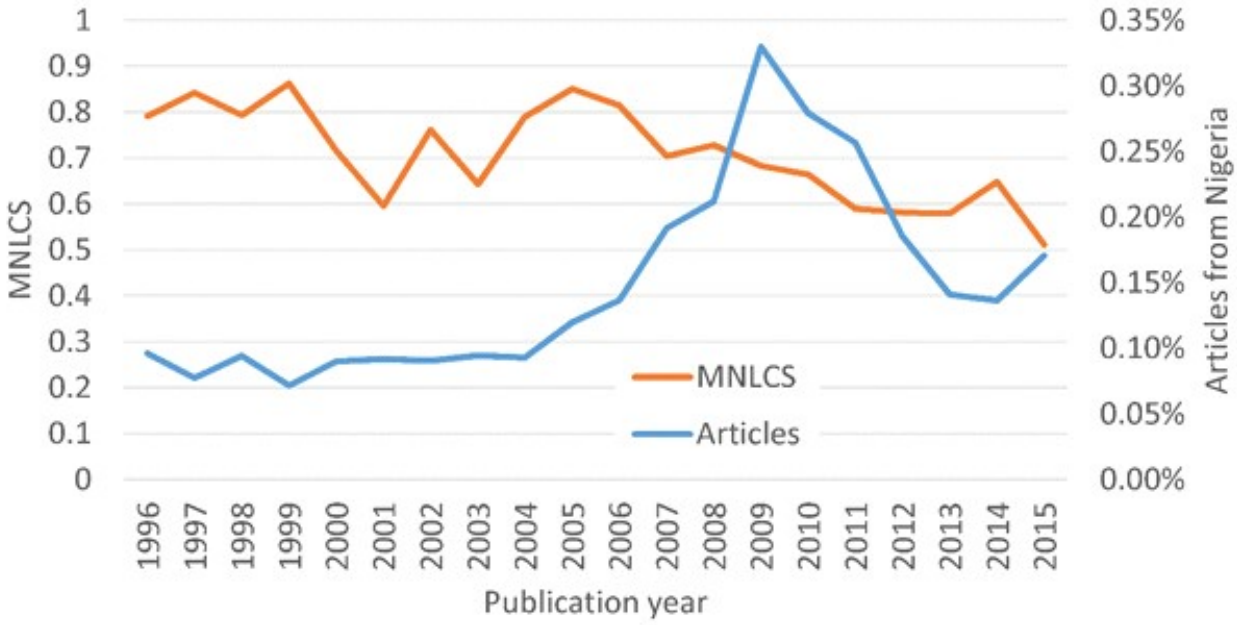

Figure 3: Nigeria's Percentage Share of the World's Journal Articles

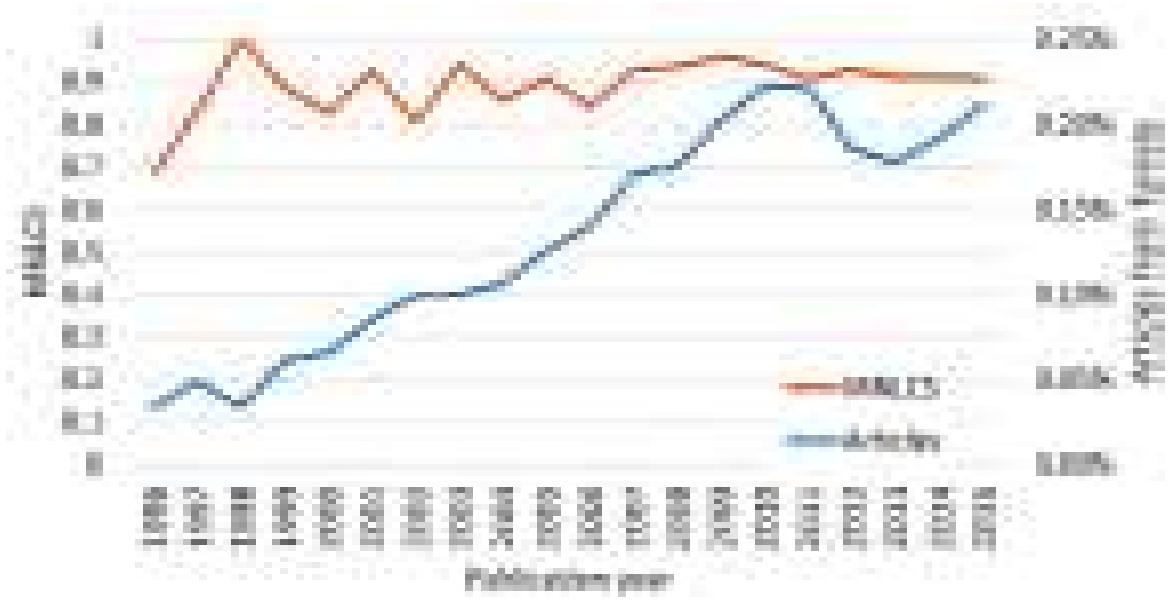

Figure 4: Tunisia's Percentage Share of the World's Journal Articles

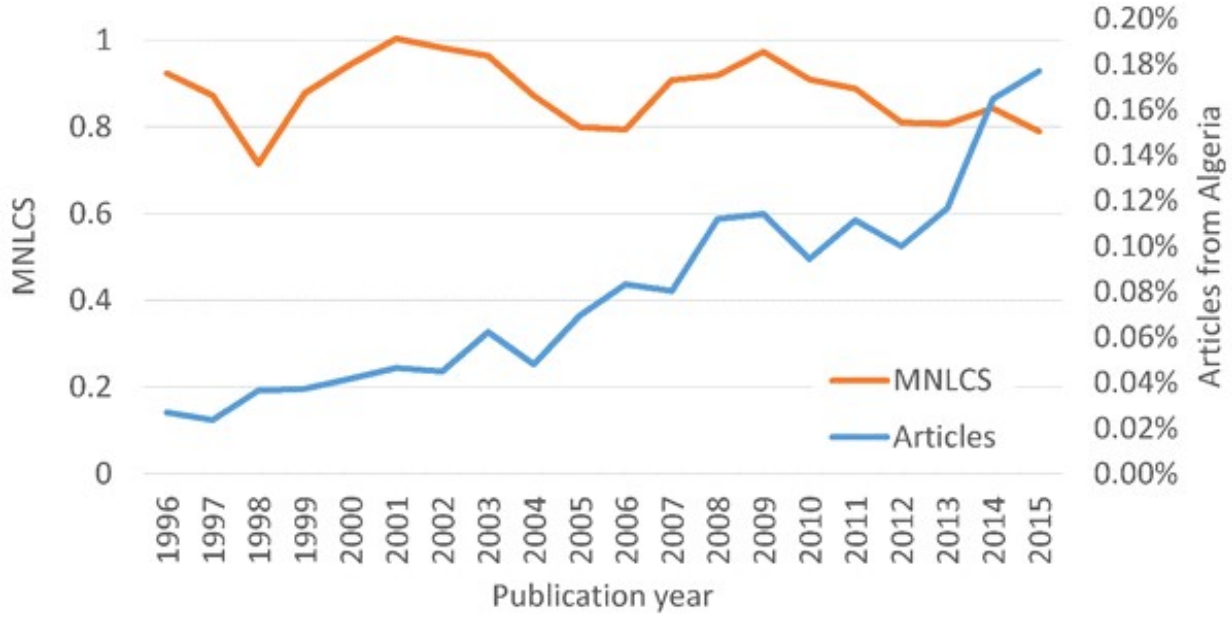

Figure 5: Algeria's Percentage Share of the World's Journal Articles

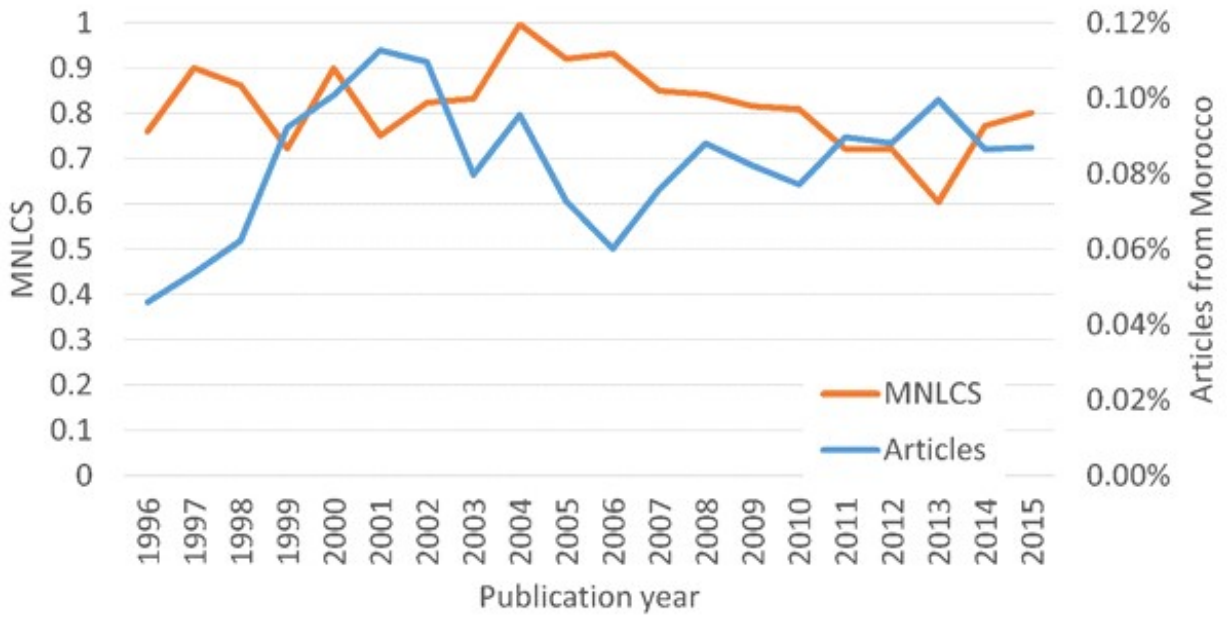

Figure 6: As Morocco's Percentage Share of the World's Journal Articles

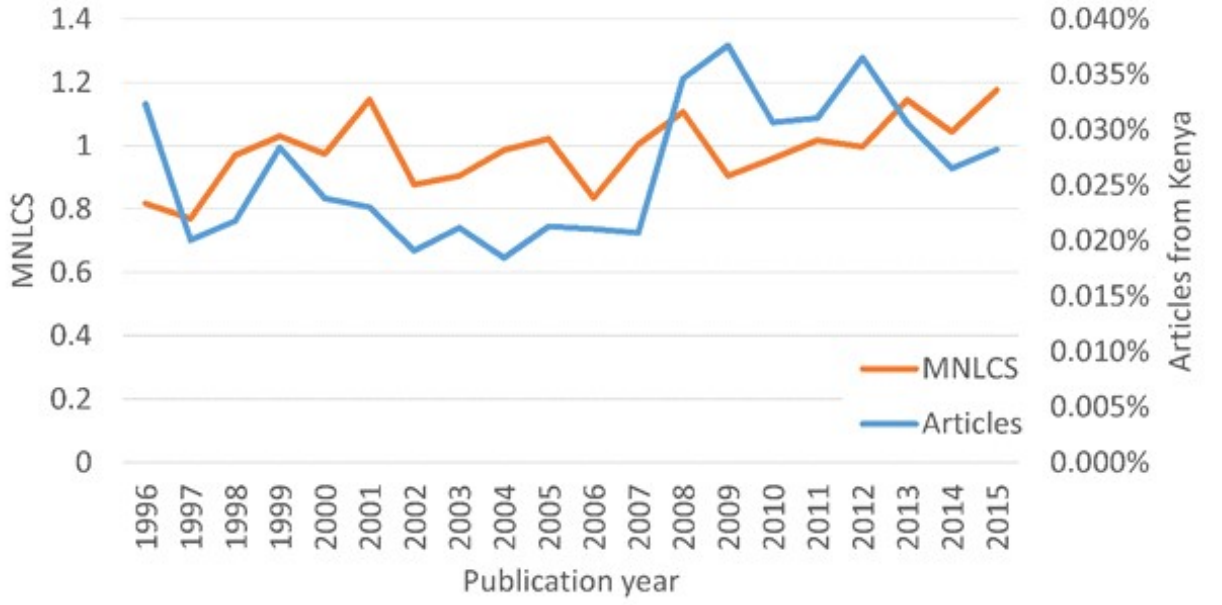

Figure 7: Kenya's Percentage Share of the World's Journal Articles

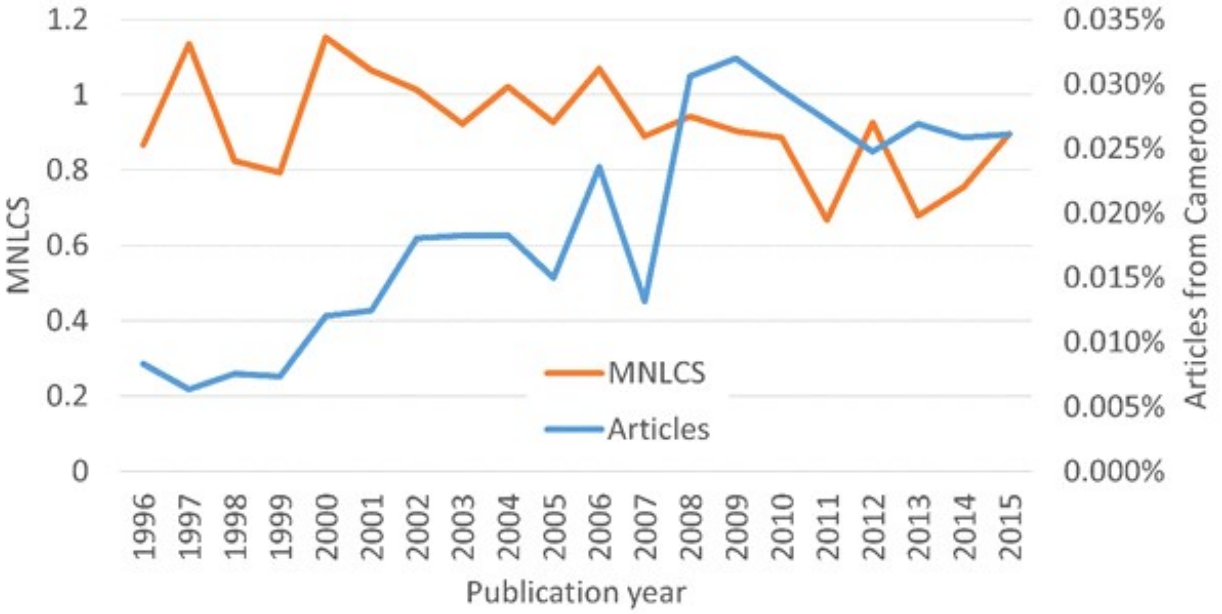

Figure 8: Cameroon's Percentage Share of the World's Journal Articles

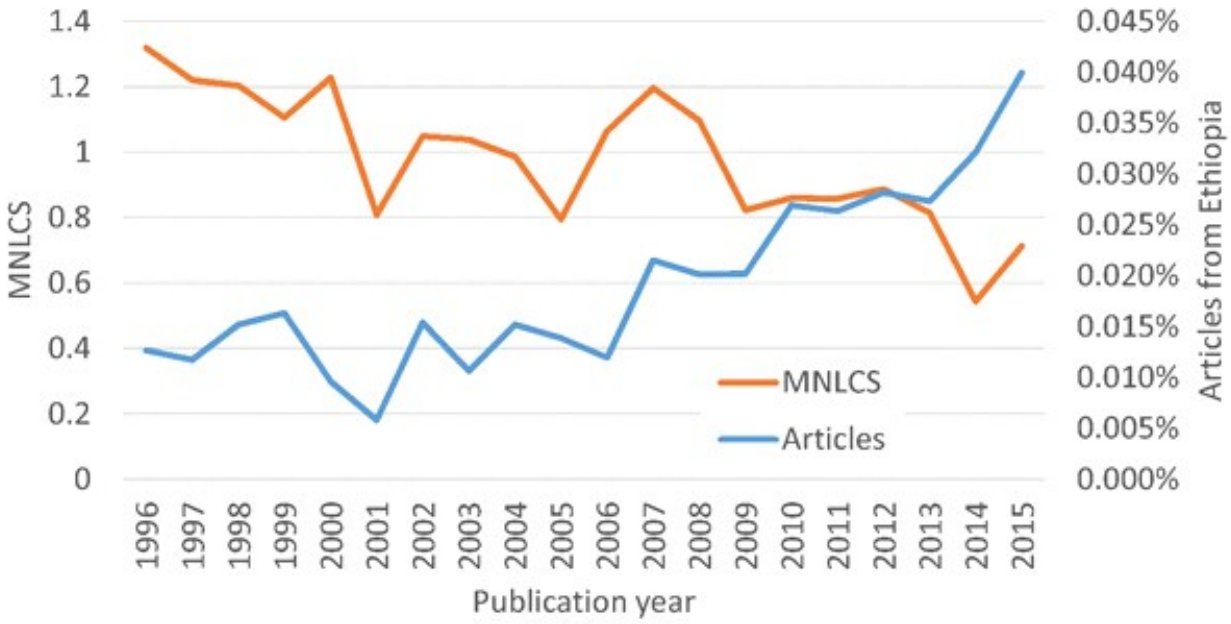

Figure 9: Ethiopia's Percentage Share of the World's Journal Articles

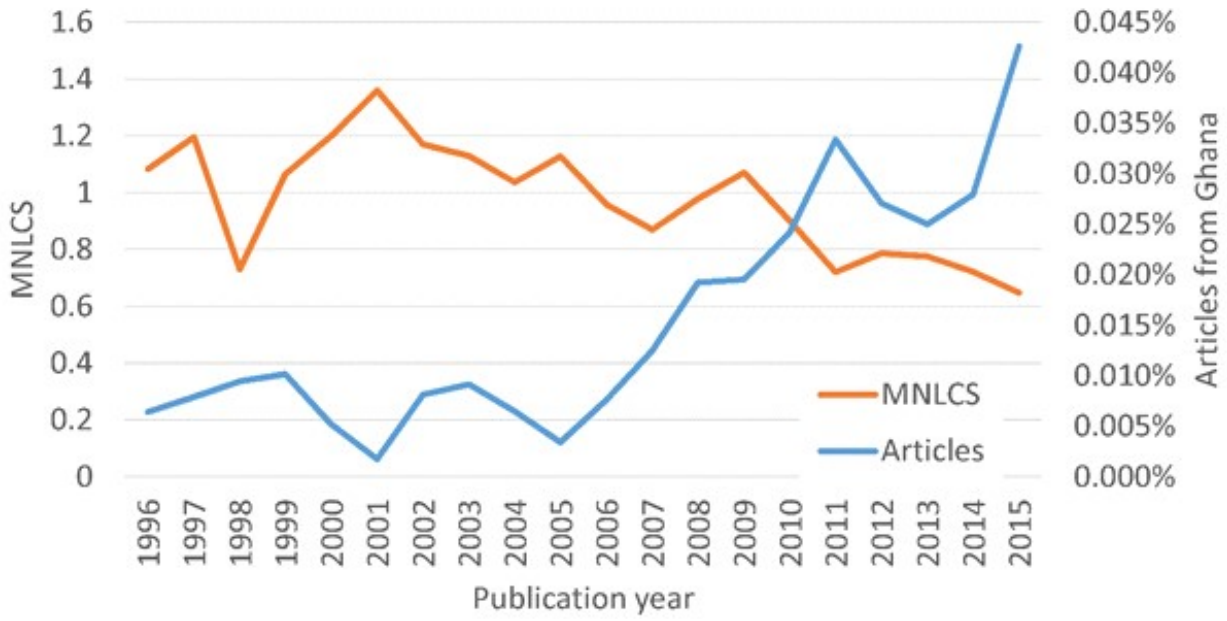

Figure 10: Ghana's Percentage Share of the World's Journal Articles

Discussion and Limitations

The answer to the first research question is not surprising, since the increase in the relative share of the world's research from Africa has been previously noticed (Confraria and Godinho, 2015). In the context of the general increase in publishing output across Africa, the decreases for Zimbabwe and Botswana are worrying. However, in Zimbabwe, political or economic instability is presumably the cause. In Botswana, science and technology has been considered important by the government for a long time (CREST, 2007), but it is possible that funding is not reaching researchers because of delays in setting up research councils (Mouton, Gaillard, and Van Lill, 2014).

For the second research question, the reduction in the citation impact of African research in most countries relative to the world average is a major concern. A possible reason for some countries is a decrease in collaboration with experienced researchers from the USA, UK and France, which may affect the quality of the work produced. Despite this, the consequence increase in self-reliance in Africa seems likely to generate long–term benefits that will eventually reverse this decline.

Since, in answer to the third research question, research in countries that produce little Scopus-indexed output do not tend to produce low impact outputs, an explanation is needed. This may be due to the predominance of international collaboration for articles in countries that produce little Scopus-indexed research (e.g., for Central Africa, see: Boshoff, 2009), so the quality of the articles may not fully reflect the international publishing capacity of the authors from the African countries involved. In Ghana, for instance, the need for international collaboration outside Africa for successful research is widely recognised (Owusu-Nimo and Boshoff, 2017). This is also supported by the data here. For example, the citation impact of forestry research from Madagascar was mostly above the world average (i.e., MNLCS values above 1, which is always the world average for MNLCS); but during 1996-2015, 36 out of its 39 forestry articles included international collaboration, as recorded in Scopus. Of these 36 international collaborations, 35 involved at least one European country or the USA, and one included only African collaborators (from Senegal). Of the two Madagascar-only articles, "Forest aboveground biomass estimates in a tropical rainforest in Madagascar: new insights from the use of wood specific gravity data" and "The evolution of cropping systems in the Lake Alaotra region of Madagascar. An approach based on temporalities", both had at

least one author with a secondary affiliation in France (not shown in Scopus). Thus, only one of the 39 articles of Madagascar in this area did not have collaboration with researchers associated with the USA or Europe, "Vegetative propagation of Ziziphus mauritiana var. Gola by micrografting and its potential for dissemination in the Sahelian Zone". Thus, the average citation impact of research in countries with a low level of scientific productivity may be primarily due to the contributions of their collaborators. This would explain why low productivity does not associate with low citation impact.

The results are limited by being restricted to 26 out of the 310 Scopus categories and being incomplete for categories and years with more than 10,000 articles. The numbers therefore account for less than 10% of Scopus-indexed content. Since less developed nations tend to have more specialised science systems (Siddiqi, Stoppani, Anadon, and Narayanamurti, 2016) and this can be important for success (Confraria, Godinho, and Wang, 2017), it is likely that the strengths of many countries have been ignored, and that the results are therefore misleading for them. The Scopus classification system is also a limitation for the citation counts: a more accurate article-based classification (e.g., Waltman, and van Eck, 2012) might have normalised the citations more effectively. The low numbers of articles produced each year by the countries ranked 11–48 make their graphs in the online supplement difficult to draw robust conclusions from. This is because MNLCS values can be due to individual articles and cannot therefore directly reflect the national research capacity. Research outputs are not restricted to journal articles but can also include books, conference papers and reports, which were not covered here, and may have more impact. In addition, scholars can make valuable contributions to the national economy in other ways, such as consultancy (Wight, Ahikire, and Kwesiga, 2014), advising governments, or introducing state of the art technologies or techniques to local industries or the public. Thus, citation impact is not a direct indicator of the contribution that researchers make to the well-being, culture or prosperity of their country.

Conclusion

The almost universal increases in the share of Scopus-indexed publications are encouraging for African countries, suggesting growth in research capability. In contrast, reductions in impact per publication relative to the world average are worrying, but have a reasonable explanation (see the discussion above), and this trend may reverse in the long term.

Thus, except in Botswana, policymakers in Africa should be encouraged by the findings because they suggest that current policies are helping Africa to increase its scientific productivity. This increase has occurred against a background of a very low share of the world's scientific publications at the start of the period (1996), and will need to be sustained to ensure that African scientists can make increasingly major contributions to technology, education, arts and culture. In the longer term, it is important to keep a careful watch on average research impact. However, although the decreases in average citation impact relative to the world average could be a side-effect of a decreasing reliance on international collaboration to produce Scopus-indexed research, the decreasing trend needs to be eventually reversed.

At the level of indicators, the current article is the first analysis of African research impact using an indicator, the MNLCS, that is not unduly influenced by the skewed nature of citation count data (Thelwall, 2017a). Its findings are therefore more statistically robust than those of previous analyses. This is a particularly important issue because of the low total numbers of articles produced in some countries (e.g., see: Thelwall and Fairclough, in press).

A complete set of graphs for all 48 countries is available in the online supplement, as well as a separate graph for each country and field (48x26=1248 graphs) https://figshare.com/s/a35f858adb73488a1c0a. These can be consulted by scientists and policy makers in individual countries to check trends in their areas of interest.

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Distance Learners' Attitude and Use Behaviour of Electronic Information Resources at the University of Namibia Library

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Abstract

This paper presents findings of the study to determine the predictors of electronic information resources use by distance learners at the University of Namibia (UNAM). The study addressed two research questions: What are the attitude and the behaviour of distance learners towards the usage of electronic information resources at the University of Namibia Library? What factors hinder the use of electronic information resources by distance learners? The study was underpinned by the Technology Acceptance Model (TAM). A quantitative approach and a survey design were used. The population consisted of distance learners. Simple random sampling was used to select the respondents. Survey questionnaire was used to collect data. The quantitative data collected was analysed using descriptive and inferential and content analysis respectively. Distance learners had positive attitudes towards electronic information resources. However, they did not make much use of electronic information resources subscribed to by the UNAM Library. The findings show that, instead, they tended to rely on print resources for their studies. The study showed that there is still a lot to be done by UNAM Library to increase the usage of electronic information resources for distance learners. The study has implication for institutional ICT infrastructure, skills development, awareness creation and budget decision about electronic resources. It was also expected that the outcome from the study would assist in proffering policy and practical interventions to improve access and use of the electronic information resources especially given the high cost of the resources.

Keywords: Attitude, Behaviour, Distance Learners, Electronic Information Resources, Namibia.

Introduction

The increasing growth of world population on one hand and revolution in information and communication technologies (ICT) on the other are some of the key variables driving distance learning. ICT use in distance learning has been described as a major breakthrough for learning and instruction (Katz, 2002), and the Internet has been particularly instrumental in promoting distance learning (Rehman, Hunjra, Safwan and Ahmad, 2010). Libraries across the globe are therefore leveraging ICT as an enabler in general and the Internet in particular to reach and provide users unimpeded access to library resources (Mutshewa and Rao, 2000) both on campus and to geographically dispersed locations 24/7 (Boadi and Letsolo, 2004).

The effective use of ICT in distance learning

is predicated not only on adequate equipment such as computer hardware and software, but also on human skills, access to relevant content, effective pedagogy, and digital literacy. Okello-Obura and Ikoja-Odongo (2010) in this regard pointed out that a students' positive attitude towards electronic resources is affected by the inadequacy of computing facilities and Internet connectivity. In addition, Technology Acceptance Model (TAM) focuses on individual acceptance of technology by using intention or usage as a dependent variable (Venkatesh, Morris, Davis and Davis, 2003). TAM is designed to explain an entire situation or behaviour, with the idea that it would eventually be able to predict that behaviour. The theory of TAM was first introduced by F. D. Davis in 1986 and applied in North America. This model was based on the Theory of Reasoned Action (TRA) for modelling of the acceptance of information technology (IT) by users. TRA is alleged to be a general theory of human behaviour, while TAM is more specific to information system usage (Mathieson, Peacock, and Chin, 2001). Numerous studies discovered that TAM yields consistently high explanatory variance on why users choose to utilise systems (Rondan-Cataluña, Arenas-Gaitán and Ramírez-Correa, 2015; Marakarkandy, Yajnik and Dasgupta, 2017). Based on TAM, as postulated by Davis (1989), it is believed that the perceived usefulness and perceived ease of use as variables serve as instrumental in explaining the variance in attitude towards use of technology for diverse purposes (Agarwal and Prasad, 1999); and also, the prediction of users' behavioural intention to use and accept the technology is dependent on what they hope to achieve in their set goals.

The 21st century has brought with it a greater demand for electronic information by library patrons, especially those studying in distance mode. This paradigm shift has compelled academic libraries as custodians of information to rethink ways of providing access to library information resources to the end users, especially distance learners. The reason for this change in information services delivery is because distance learners are often neither around to talk to nor visible to librarians (Liu, 2006). The importance of understanding the dynamics of learning in distance context need not be overemphasised. Distance learners by and large are adults who live in remote areas away from the campus and have been out of the educational system for a considerable length of time. They often are constrained by time to attend face-to-face classes due to the demand of work and family. They study along with work and family commitments and may need to access library resources at all times (Unwin, Stephens and Bolton, 1998). In Namibia, though access to knowledge and information by all is a top government priority (Government of the Republic of Namibia, 2007), the challenges of delivering electronic resources to distance learners are numerous. Niskala (2008) pointed out that some of the challenges faced by tertiary level distance learners in Namibia include lack of connectivity, inadequacy of electronic resources, and unequal distribution of access facilities to tapping the learning resources (Government of the Republic of Namibia, 2007).

Statement of the Problem

During the academic year 2011, UNAM Library statistics suggested that of 3612 distance learners at the University, only 647 (17.9%) were registered with the library and the remaining 2965 (82.1%) were neither borrowing library materials nor did they have access to electronic information resources such as electronic books, electronic journal articles, newspaper, theses, dissertations, and databases (e.g. Emerald, Ebscohost, and Scopus) both on and off campus. UNAM has ten learning centres for External Studies for distance learners across the country to cater for the increasing number of its distance learners. A study by Katjihingua (2001) on the University of Namibia distance learners and off-campus library services indicated that the majority of distance learners used print materials as opposed to electronic resources. Anecdotal evidence and the researchers' personal experiences as the Distance Education Librarian at University of Namibia, between the years 2009 and 2012, revealed that a majority of distance learners made little or no use of electronic resources provided by UNAM Library despite high cost of electronic resources that the University Library was incurring. Generally, the attitudes of the learners towards electronic resources seemed lukewarm. It was not clear whether the non-use was attributed to lack of skills, lack of connectivity and ICT facilities, lack of awareness or simply preference for print resources. Little or complete lack of empirical research to reveal or

confirm the causes meant that any policy or practical interventions to alleviate the situation would not be well informed.

Boadi and Letsolo (2004) asserted that the non-use of electronic resources by distance learners could be attributed to a number of factors such as lack of confidence as a result of returning to study long after their initial qualification and unfamiliarity with modern information-seeking tools. The lack of use of electronic resources as attributed to Boadi and Letsolo (2004) work was significant because the UNAM Library has over the past years subscribed to various electronic resources to meet the information needs of both on-and off-campus learners. Consequently, this leads to the introduction of various platforms such as the library website, through which electronic information resources could be accessed. The non-use of the electronic resources was therefore worrisome. Papacharissi and Rubin (2000) are of the view that one requires greater understanding of the personal and social attributes that affect people using electronic resources and their related information-seeking behaviour. Katjihingua (2001), Mawindo and Hoskins (2008) seem to suggest that learners (distance or not) prefer print information resources. A study by Niskala (2008) in Namibia was limited to public libraries. A study of this nature has not been carried out at UNAM before. It can therefore be argued that there is no conclusive evidence regarding the issue of electronic information resources usage among distance learners at UNAM. This study hopes to fill the knowledge gap on electronic information resources use by distance learners in academic libraries specifically in the Namibian context.

This study, aimed at investigating some of the predictors of electronic resources use by distance learners at UNAM, especially attitudes, perceptions and usage. Therefore, the study addressed the following two research questions:

(1) What are the attitudes and the behaviour of distance learners towards the usage of electronic information resources at the University of Namibia Library?

(2) What factors hinder the use of electronic information resources by distance learners?

Theory and Literature Review

This section discusses the theoretical framework on which the study is anchored and the related literature on the use and the challenges of electronic information resources (EIR) by distance learners at the University of Namibia. There are several theoretical frameworks underpinning technology adoption. They include the Technology Acceptance Model (TAM); Theory of Reasoned Action (TRA); Theory of Planned Behaviour (TPB); the Decomposed Theory of Planned Behaviour (DTPB) have been employed to investigate user acceptance and usage behaviour of emerging information technologies (Venkatesh, 2000). These models have been used to explain and predict the use of technology by students and non-students (Agarwal and Prasad, 1999) in different contextual settings. However, TAM which underpins this study is particularly robust in predicting and explaining technology acceptance and use in various situations (Dillon and Morris, 1996). Distance learners' overall attitude towards using electronic information resources is shown as a function of the belief constructs of the Technology Acceptance Model. Two variables used in this study to predict the attitude and behaviour of distance learners toward the usage of electronic resources at UNAM were Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Agarwal and Prasad (1999) and Sheikhshoaei and Oloumi (2011) asserted that these two beliefs are instrumental in explaining users attitudes towards electronic resources and also help in explaining their behavioural intention to use the resources. Several studies show that experience with technology and electronic resources is a good predictor of electronic resources usages behaviour (Ma, Andersson and Streith, 2005 and Kripanont, 2007). Many of these previous researchers on electronic acceptance were done using the Technology Acceptance Model developed by Davis (1989).

Tella, Tella, Ayeni and Omoba (2007) asserted that students with high-self efficacy would be more likely to take advantage of what was around them if they were familiar and felt comfortable with electronic resources. Ren (2000) surveyed 85 students before and after library instruction and found that students' self-efficacy in electronic information searching increased after the training, and that the

increase was related to attitudes, emotional experiences, search performance and more. These findings implied that training and library instructions were important determinants of learners' attitudes towards the use of electronic information resources. Accordingly, if learners received adequate training, then their attitude was altered positively and they would therefore make better use of electronic resources because of their enhanced self-efficacy (Ren, 2000). Tang and Tseng (2013) likewise found that students with high self-efficacy made better use of electronic information and had better academic performance. With the help of computer technology and ICT infrastructure, distance learners are now able to become more productive in the learning process in order to achieve learning goals better (Ma, Andersson, and Streith, 2005). It is evident in the literature that attitudes and perceptions of distance learners towards electronic information resources play important part of access to such resources. Swain and Panda (2009) observed that users' attitudes towards information are gradually shifting from the printed documents to electronic resources. In the same vein, Christine (2007) asserted that students are increasingly turning to electronic resources available via the web to find information for completing their assignments.

Despite the increasing use of electronic resources by distance learners, a number of obstacles hampering access to such resources have been found in developing countries such as Ghana and Lesotho (Martey, 2004; and Boadi and Letsolo, 2004). These obstacles include among others: inadequate funding; inadequate electricity supply, little knowledge of searching the Internet, lack of personal interest, shortage of technical support; inadequate ICT facilities; poor Internet connectivity; low level of computer literacy, inadequate PC, lack of information about how to use electronic resources, and lack of time to acquire skills needed to use resources (Marley, 2004; Adogbeji and Akporhonor, 2005; and Dadzie, 2005). Similar findings were also reached in a study by Ray and Day (1998) on students' attitudes towards electronic resources. They also found that students lamented over time consumption and retrieval of much volumes of information with the use of electronic resources.

Boadi and Letsholo (2004) found that distance learners at the Extra-Mural Studies, Maseru, Lesotho experienced difficulty in accessing on-campus library and information sources and services and often relied on sources from colleagues, personal collections, co-workers and family members. The literature reviewed showed that there is increasing use of electronic resources around the world. However, access was being hampered, especially in some countries, by a number of obstacles relating to ICT infrastructure, limited skills, lack of awareness and limited resources, among others that must be addressed through practical and policy interventions to enhance to electronic resources. Therefore, based on the findings from different studies in the literature, it can be ascertained that the use of EIR by distance learner would continue to be on the increase, thus the need for this study..

Methodology

This study adopted the survey approach to gather information on the use of electronic information resources by distance learners at UNAM. One motivating factor for using a survey method was because surveys measure facts, attitudes, beliefs, opinions, characteristics, past or present behaviour, and expectations and knowledge through questions. The survey approach allowed the researcher to use the TAM framework, similar to studies conducted by May (2001) and Neuman, (2003) cited in Okello-Obura and Ikoja-Odongo (2010). The target population in this study was 3,612 distance learners. Based on the model of Saunders, Lewis and Thornhill (2012) from an overall target population of 3,612, a sample size of 357 (this figure lies closer to 5,000 than it is to 2,000) was derived. This sample size gave the researcher some degree of confidence that the findings would truly be a fair representation of the population. A survey questionnaire consisting of open -and close- ended questions was used to collect data from the respondents. The reliability of the research instrument was achieved through pretesting to ensure that it was correctly worded, in order to avoid misinterpretation by respondents. Validity was attained through a careful selection of a representative sample and data analysis. To ensure that the tests for this study were valid and reliable, the questionnaire was peer reviewed and pre-tested. The researcher also ensured proper documentation of the methodology. The questions used for this study were designed with the goal of achieving a high

response rate and a deeper understanding of distance learners' preferences and circumstances that affect their choice of format regarding library electronic information resources. From the three hundred and fifty seven (357) copies of questionnaire distributed two hundred and forty three copies of the questionnaires (243) were returned, giving a response rate of 68%. Quantitative data were analysed through the use of descriptive and inferential analysis. Content analysis technique was used to analyse qualitative data collected from open ended questions. The results were categorised and presented descriptively in this paper. Respondents were asked to sign a declaration of consent form and were reminded of the researchers' as well as their own ethical responsibility.

Findings

This section presents respondents, cross-tabulation between age, gender and two research questions that were earlier stated in this paper. It also presents findings on factors hindering the use of electronic information resources by distance learners at UNAM library.

Profiles of the Respondents

Learners were asked to indicate their gender and age. The results in Table 1 below show that gender composition of respondents had majority 151 (62%) of learners who were females, while the male constituted the minority 93 (38%). This indicates that there were more female participants than male participants in this study. This could mean that women did not have equal opportunities of undertaking full-time studies like their male counterparts presumably because of their role of childbearing as well as attending to other household chores.

Table 1: Gender and age cross tabulation (N=243)

Gender	Age				Total Count/ Per Cent
	21-30 years	31-40 years	41-50 years	51-60 years	
Male	37	46	9	1	93
	15%	19%	4%	0%	38%
Female	81	61	7	2	151
	33%	25%	3%	1%	62%
Total Count/Per Cent	118	107	15	3	243
	48%	44%	7%	1%	100%

Table 1 further shows that about 118 (48%) of respondents were between age group 21-30 years and 107 (44%) were in the age group 31-40 years. The lowest results were of 15 (7%) in the age group of 41-50 years and about 1% was in age group 51-60 years. The large number of respondents (21-30 years) who participated in the study than their old counterparts (51-60 years) could suggest that the frequent users of electronic information resources provided by the UNAM Library were the younger adults between the ages of 21 and 30 years.

Research Question 1: What are the usage behaviour and the attitudes of distance learners towards electronic resources at UNAM?

Attitudes and Behaviour of Distance Learners towards the Usage of Electronic Information Resources

Respondents were asked to state the benefits derived from using electronic information resources. The results show that 126 (52%) indicated that they had remote access (24/7 access; quick access and wider

access to electronic resources). About 83 (34%) of the learners pointed out that electronic resources were good because one has links to additional information. About 78 (32%) felt there was no limit on what one is able to access; and the least, 44 (18%) of the learners noted the advantage of having multiple accesses for single sources. This result suggests that most of the learners were optimistic about using electronic resources, as they believed electronic information resources significantly enhanced their studies.

The findings in Figure 1 indicate that about 94 (39%) agreed that the Internet enhanced their ability to access the latest educational information, against four (two percent) learners who disagreed. Some users 128 (53%) disagreed and 59 (24%) strongly disagreed with the statement, "the available information on the Internet confuses me", with 36 (15%) agreeing. Most 86 (35%) of learners were in agreement with the statement, "I mainly use the Internet to communicate", while 59 (24%) disagreed with the statement. More than half of the learners 130 (53%) agreed that electronic information resources made them enjoy their studies, whereas, on the other hand, a total of 15 (Six percent) disagreed with this statement. Many learners 125 (51%) disagreed with the statement, "I feel overloaded with all the information available". About 49 (20%) agreed with the statement, while 44 (18%) disagreed with the statement. The respondents' perception on the statement, "I feel comfortable with the way I conduct information searches on the Internet" was mainly positive. More than half 127(52%) of the learners agreed that they felt comfortable, whereas 27 (11%) disagreed with the statement. The statement, "I believe that using electronic resources for studies, research and assignment would be beneficial for me" received a good response rate. Most learners 126 (52%) agreed with the statement, while 107 (44%) strongly agreed, with eight (3%) disagreeing. A total of 84 (35%) of the learners strongly agreed that it would be desirable to use electronic resources for their studies, whereas 17 (seven percent) disagreed. The respondents' perception on the statement, "Given the opportunity to choose between electronic resources and print resources, I would choose print resource" was mainly negative. A minority (90, making up 37%) of learners disagreed that they would choose print resources, 69 (28%) agreed, and 46 (19%) strongly agreed with the statement. The results suggest that the usability of electronic information resources was found to affect the attitude of users and their willingness to use them. The results of the descriptive statistics also suggest that electronic information resources were perceived as useful, and that the learners felt confident about working with computers and intended to use electronic information resources as needed. Reaction to use electronic information resources influenced actual usage of the electronic resources, which in return influenced intention to use the resources. It is expected that perceived usefulness will significantly determine usage behaviour in using electronic information resources by distance learners.

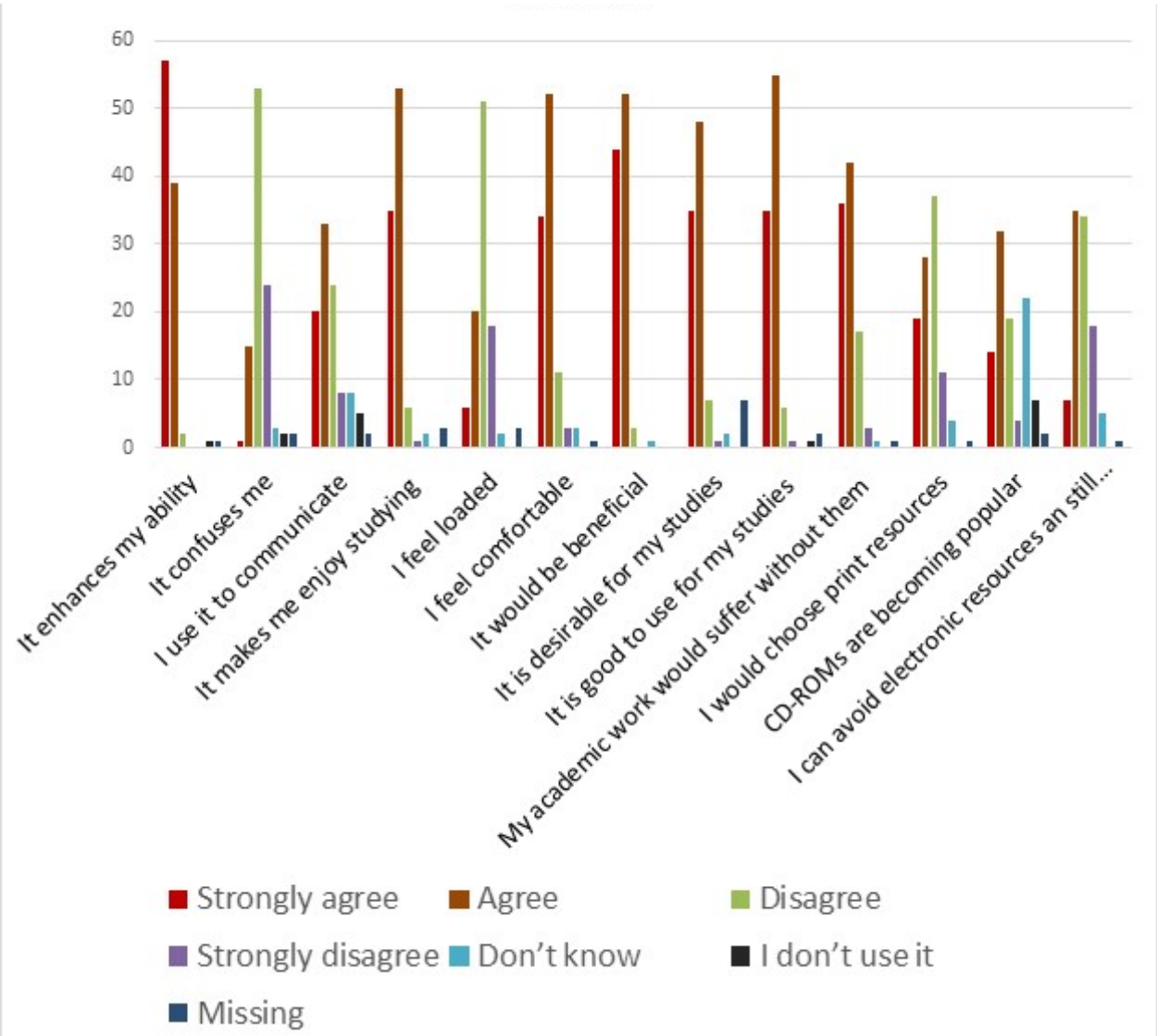

Figure 1: Attitude and Behaviour of Distance Learners towards the Usage of Electronic Information Resources (N=243)

Research Question 2: What factors hinder the use of electronic information resources by distance learners?

Impediments to the Use of Electronic Resources by Distance Learners

The objective of this research question was to determine those factors that hindered or prohibited distance learners from successfully utilising electronic information resources.

Findings revealed that less than half 107 (44%) of the learners surveyed complained about the Internet access speed, which they considered to be very slow. Eighty-three (34%) of the learners indicated that they felt overloaded with information and equally felt that they did not have enough time to search for information. Additionally, 69 (29%) noted that they did not know how to search for information. Very few, below five per cent of the respondents felt they did not benefit from the Internet. The rest of the barriers (No access to PC, 19 (7%); I lack

trust, 11 (4%); Internet benefits 4(1%); received a very low (below 10%) percentage. Resource factors such as time (not enough time) and money (high Internet costs) needed by learners to use electronic resources effectively had a negative effect on perceived usefulness and behavioural intention and usage.

The comments raised in the open-ended questions by respondents were categorised as follows: Internet speed, distance from the learning centres, and student support. These general comments are summarised as follows:

Internet Speed

General comments on the Internet were as follows:

"The Otjiwarngo centre is facing low Internet speed, something should be done as downloads speed is too slow."

"The learning centres Internet access is very slow."

"Yes mostly distance learners working at government offices are suffering due to poor Internet connectivity."

Distance Travelled by Students to the Centres

A general comment raised was the distance travelled to the learning centres. The learners' responses varied. For example, most of them stressed that they did not visit the centres due to work commitments and living in remote areas. Some respondents remarked "distance learners are in rural areas where there is no reliable electricity or network", "facilities in the remote area are major reasons why most students from rural areas struggle with accessing information online" ;and "learning centres are far from our places, and the schools where we are teaching have no Internet connectivity."

Access to Resources

Learners also commented on issues regarding access to electronic information resources available online (the Internet). Their responses were:

"Most relevant documents online are available at a cost making it harder for us to access information."

"Electronic information resources are useful but cost and time for access is challenging."

"As a distance student, we have limited time when it comes to the use of Internet."

"Most of the computers in the UNAM Library are out of order and there are few computers for students to use for typing and Internet searches".

"The use of Internet is very important to everybody; however, most of us who are doing distance studies are not having Internet access."

Discussion of Findings

The results in this study reveal that 118 (48%) respondents were between the ages of 21 and 30 years, and 15 (seven per cent were between the ages of 41 and 50 years (see results in Table 1). There were many younger participants than older ones perhaps, thus suggesting that those who frequently used electronic resources were the younger generation. This generation is generally able to "multitask, learn systems without consulting manuals, and surf the Web, however, they lack technology and information skills appropriate for academic work" (Korobili, Malliari, and Zapounidou, 2011) and are easily vulnerable to social influence (Lu *et al*., 2003). Abedalaziz, Jamaluddin and Leng (2013) asserted that postgraduate students had positive attitudes toward computer and Internet increase as their age decreases.

A review of the data analysed under the first research question (see Figure 1) reveals that respondents showed a positive attitude towards electronic information resources. The technology acceptance model (TAM) asserts that intention is a proper way to examine and predict a users' behaviour towards a particular technology or system (Kripanont, 2007). The theoretical justification of this study lies in the findings that respondents used electronic information resources because it is beneficial for their studies. As such, learners' intentions to use electronic information resources were examined. Respondents' attitude and perceived usefulness of electronic information resources influenced their behavioural intention to use them due to positive benefits as reflected in the results presented in Figure 1, which shows that 84 (35%) strongly agreed that it would be desirable to use electronic resources for their studies.

There are a number of factors that endear distance learners to use electronic information

resources; one being the fact that electronic resources are proving to be invaluable research tools that complement the print-based resources in a traditional library setting (Kumar and Kumar, 2008 cited in Adeniran, 2013). This is confirmed by the results which indicated that more than half 126 (52%) of the respondents would choose to use electronic resources because they had remote access (24/7 access) to electronic information resources. A range of online resources have emerged to make the learning processes of distance learners speedier and less tedious 24/7 as long as there is adequate connectivity. Liu and Luo (2011) affirmed that distance learners find electronic resources useful for various reasons such as robust searching capability, speed, convenience and completeness and can be accessed anytime from anywhere with online access. As shown in Figure 1, 90 (37%) of respondents disagreed that they would choose print resources. These findings revealed that there were a substantial number of respondents who preferred print resources and had positive attitudes towards them. Understanding factors that endeared distance learners towards electronic resources ensure users are encouraged to accept and continually use digital library services (Liu and Luo, 2011). For electronic resources to be useful, they must be accepted by the library users, particularly distance learners. The technology acceptance model posits that use is influenced by ease of use. Moreover, both ease of use and usefulness predict behaviour (Mathieson, Peacock and Chin, 2001).

One of the research questions sought to determine factors that inhibited learners from successfully utilising electronic information resources. The results show, among other factors, lack of computer skills and the lack of ICT facilities. The factor of computer skills and experience had a significantly negative effect on behavioural intentions toward electronic information resources through the factor of perceived usefulness. Okello-Obura and Odongo (2010), in their study on electronic information seeking among LIS postgraduate students at Makerere University in Uganda, found that students' positive attitude towards electronic resources was affected by inadequate computing facilities or poor Internet connection. It is evident from the findings that most learners came from under-resourced backgrounds, with lack of infrastructure and facing financial constrains to access electronic information resources. About 81 (33%) indicated that they did not have enough time to search for information. It can be assumed that the availability of resources has an impact on whether learners will use the electronic resources or not. Mathieson, Peacock and Chin (2001) also agreed saying there might be situations in which an individual wants to use an information system, but is prevented by lack of time, money and expertise. Some respondents in this study commented that most relevant documents online are available at a cost, making it harder to access electronic information resources.

About 81 (33%) of the respondents indicated that they felt overloaded with information. They were clearly faced with problems regarding quantity and quality of information got from the Internet or the databases. Students faced an abundance of information which they were unable to deal with. In consonance with these findings is a study by Adeniran (2013) who also found that factors that affected effective utilisation of electronic resources by undergraduate students included large mass of irrelevant information, the need to filter the results from search, failure to find information, and difficulties in navigating through electronic resource. In spite of all the challenges faced by distance learners, all is not lost.

Conclusion and Recommendations

On the basis of the discussions of the findings, several conclusions and recommendations are drawn. Like many related studies in literature, respondents (learners) in this study appreciated the unique features and benefits electronic information resources presented such as having 24 hours access, remote and faster access to electronic information resources. However, the respondents did not make use of electronic information resources subscribed to by the UNAM Library because of impediments such as high cost of access, poor Internet connectivity, electricity outages, lack of sufficient computers, and low levels of computer skills. Several studies cited earlier have shown that a positive attitude is an important factor that significantly contributes towards technology adoption and use by users of technology. It is therefore concluded that with all other factors being equal, that

is, adequate ICT facilities and skills, the use of electronic resources among distance learners would be enhanced. The effective use of electronic resources depends largely on a number of factors such as level of awareness, training, skills and ICT competencies of the learners. In this study, learners' attitudes clearly played a significant role in influencing their intentional behaviour towards the use of electronic resources. Other variables which could also influence learners behaviours to use electronic resources were perceived usefulness, self-efficacy, subjective norms and facilitating conditions. The findings, therefore, illustrate that those respondents who perceived electronic information resources as useful had stronger intentions to use them. Findings confirmed that the UNAM Library subscribed to a vast number of adequate electronic information resources. However, there were inadequate ICT infrastructure and facilities which hindered learners from accessing electronic information resources, especially at the learning centres.

Awareness is a powerful determinant of users' behavioural intention towards the use of electronic information resources. There was lack of awareness about the electronic information resources that were available in UNAM Library, and this created negative attitudes that impacted on the usage of the electronic resources. With regards to the perception of learners about their ICT competencies to use electronic resources, conclusion is drawn to the effect that the learners lacked such competencies to use electronic information resources effectively. Many were self-taught, and they expressed the need for training to enhance their skills in using electronic information resources. Such training, as stated by Appleton (2006), could include how to use electronic resources, as well as how to search and retrieve information resources from the Internet. The study found perceived usefulness to have a significant impact on both intention to use and actual use of electronic information resources. This study also found the overall use of the TAM in studying distance learners use of e-resources, especially with regards to behavioural attitude and behavioural intention to use the resources useful. The outcome of this study is expected to make an important contribution in the area of policy formulation, theory, practical interventions, capacity building, skills development, and infrastructure development to enhance distance learners use of electronic resources at the University of Namibia.

The study has empirically identified factors influencing distance learners' adoption and acceptance of ICT technologies from a developing country context; Namibia being a case in point, through investigating variables such as PU, PEOU, subjective norms, and self-efficacy, perceived behavioural intention, and facilitating conditions, among others.

Given the significance of electronic information resources in academic libraries and their current usage statistics at UNAM, the following implications for policy have been identified: The study has revealed that the electronic information resources at UNAM Library were not sufficient and the library had very limited funds for acquisitions of these information resources. UNAM Library has a draft collection development policy where electronic resources are briefly discussed. The sections in the policy on electronic resources touch on the following issues: *Criteria to consider when subscribing to and purchasing of electronic resources; Electronic journals; Electronic books; Electronic databases; Institutional repository; Open access; Platforms; License agreements; and Criteria for cancelling e-resources subscription*. The absence of a full-fledged electronic resources collection development policy has a negative impact on the library's collection development practices. Most of the collection development practices concerning electronic resources as mentioned above are currently haphazardly done, as there are no clearly documented guidelines to guide the collection development tasks. An electronic resources collection development policy is needed to guide collection acquisition decisions and address faculty and students' needs (White and Crawford, 1997).

The effective use of electronic resources lies solely on skills training of learners. This study found that most of those competency requirements were lacking in the learners, hence the problem of very low usage of electronic resources. The study recommends the following activities to be undertaken for learners' skills development:

- A multi-pronged approach should be used to impart ICT skills and digital literacy through workshops, orientation programmes, and user

education at UNAM main library and at the centres.

- UNAM should make provisions for the training and retraining of librarians, as well as distance learners in computer literacy.
- The UNAM Library should continuously train and orientate students throughout their academic years at university.

A wide range of electronic information resources were found available at UNAM, but these were hardly used by learners, partly because of poor ICT infrastructure. It is therefore recommended that:

- University of Namibia should invest in ICT infrastructure and power supply for the effective use of electronic resources. This would enable distance learners in rural areas to benefit from modern technology.
- More high-speed computer terminals should be installed in the various departments, departmental libraries and computer laboratories.
- Moreover, additional computers are needed in the main campus library and at the learning centres for the benefit of the learners.
- High speed Wi-Fi is also needed in the learning centres countrywide, in order to ensure and facilitate the effective access and usage of electronic information resources and Internet within the campus and at the learning centres by learners.

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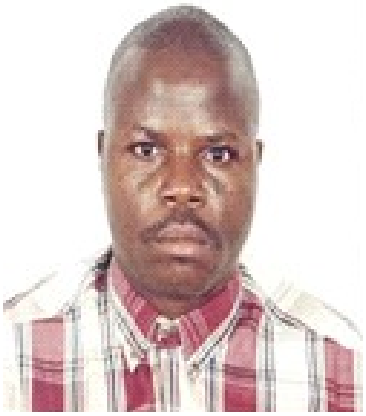

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Accessibility of Resources and Delivery Methods as Correlates of Information Literacy Competence of Undergraduates in Southern Nigerian Universities

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Abstract

Information literacy (IL) connotes ability to use information resources from various sources for making decisions and solving problems. The IL competence enables individuals to identify their information needs, locate, retrieve, critically evaluate, synthesise and use information resources ethically, and communicate the results. However, research reports revealed that undergraduate students in Southern Nigerian universities have poor IL competence. This study, therefore, sets out to determine the factors responsible for poor IL competence of the students, by adopting survey research design of correlational type. Multistage sampling was used to select a sample size of 1,967 from a population of 39, 338 final year undergraduate students in nine universities in Southern Nigeria. Researcher-designed questionnaire and IL competence test were used for the data gathering. After validation by experts, the instruments were subjected to test-retest reliability with two weeks interval, and the overall coefficient yielded r = 0.87. The findings reveal that resources with high accessibility were: conducive library environment (75.5%), Internet (60.7%) and IL educators (60.4%). Instructional videos (35.5%) and web 2.0 (31.7%) had poor accessibility; face-to-face lectures in classrooms (78.5%) dominated IL instructions, whereas ICT laboratories (39.8%), power-point presentations (30.8%) and web 2.0/ web-based tutorials (16.7%) were hardly used; students' IL competence level was found to be very poor, with overall mean of 30 %. Strong positive and significant relationships were found among resources accessibility, delivery methods and IL competence, $r_s(1541)=.919, p<0.05$ and $r_s(1541)=.919, p<0.05$, respectively. The study concluded that resources and delivery methods were the factors affecting students' level of IL competence, and recommended adequate provision of requisite resources, adoption and use of web-based IL instructional methods, sensitisation of the students on the essence of IL and development of IL competence framework for IL programmes in Southern Nigerian universities.

Keywords: Information Literacy Competence, Resources, Delivery Methods, Students, Universities

Introduction

Universities are institutions that are responsible for training and development of high level manpower with requisite knowledge, skills and competences. These human resources, which are expected to possess various graduate attributes, are often expected to serve as agents for spearheading and contributing to the growth and development of all sectors of the society's economy. One of the strategic graduate attributes expected from university products in the present knowledge economy is the possession of information literacy (IL), a set of competences required for accessing and using reliable information that is suitable for making decisions and solving problems. The concept of IL was propounded in 1974

when the then President of the United States Information Industry Association, Paul Zurkowski, remarked that people trained in the application of information resources to their work can be called information literates, because they have learnt the skills and techniques of using information resources in moulding information-based solutions to their problems (Uribe-Tirado and Munoz, 2012).

The Association of College and Research Libraries (ACRL) posits that IL is a set of abilities requiring individuals to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information (ACRL, 2000). It is a set of skills that enable individuals to identify their information needs, seek out resources to address the needs, retrieve and use the resources appropriately for the satisfaction of their information needs. These individuals operate in different areas of endeavour and diverse sectors of the economy; thus, making IL to have many dimensions. Thus, an information-literate individual, (who could be a civil servant, legal practitioner, medical personnel, teacher, or student, etc.), should be able to complete a problem solving process, which requires him/her to identify the extent of information needed, access the needed information effectively and efficiently, critically evaluate the accessed information and its sources, engage in information synthesis and use the information accordingly for a specific purpose, all in adherence to principles of information ethics.

Since the emergence of the IL concept, many international organisations have been projecting it in all areas of human endeavour. These organisations have descriptions of IL, and formulated different IL frameworks, developed competency standards, performance indicators and expected learning outcomes for the implementation of IL programmes in different environments across the universe. Meanwhile, the major avenue through which undergraduate students of universities acquire and possess IL is through its instructional programmes such as user education, use of library, study skills and information use courses, which are implemented by librarians as educators. IL instructions lead to acquisition of IL competence, with many benefits for students. It improves students' research capacity, scientific writing skills, active participation and quality academic engagements, learning outcomes and general academic achievements, employability after graduation, and development of viable entrepreneurial opportunities after graduation (Thompson and Blankinship, 2015; Anunobi and Ukwuoma, 2016).

For years, librarians in Southern Nigerian universities have been conducting IL instructions for students to enable them acquire IL competence. However, despite librarians' delivery of IL instructions, empirical studies have shown that undergraduate (UG) students in Southern Nigerian universities have poor IL competence (Oyedum, 2010; Nwalo and Oyedum, 2011; Ukpebor and Emojorho, 2012; Ekenna and Mabawonku, 2013; Igwe and Ndubuisi-Okoh, 2014; Ukachi, 2015; Onuoha and Molokwu, 2016). In addition, studies also indicated that many Nigerian graduates are not information literate (Poopola and Okiki, 2013; Jinadu and Kiran, 2016). Poor IL competence impedes academic pursuits, hampers the acquisition of knowledge, retards academic performance, impedes lifelong learning capability, affects access to jobs and performance at work places, as well as influences exploration and development of entrepreneurial opportunities. Thus, poor IL competence implies that there are factors responsible and therefore requires investigation.

Meanwhile, despite the fact that many of the aforementioned studies identified poor IL competence of UG students, they did not investigate the factors associated with it. Through literature review, factors identified and examined were accessibility of resources for IL programmes and delivery methods used during IL instructions. Therefore, this study investigated accessibility of resources and delivery methods as factors that could affect the level of IL competence of UG students in Southern Nigerian universities. Specifically, the study answered and tested the following research questions and hypotheses, respectively:

i. What is the extent of accessibility of resources by UG students in Southern Nigerian universities?

ii. What are the delivery methods used for IL instructions in Southern Nigerian universities?

iii. What is the level of IL competence of UG students in Southern Nigerian universities?

Ho_1. – There is no significant relationship between accessibility of resources and IL competence of UG students in Southern Nigerian universities.

Ho_2. – There is no significant relationship between delivery methods used in IL instructions and IL competence of UG students in Southern Nigerian universities.

Review of Related Literature

Resources – human, material or information, are fundamental in teaching and learning process; in this case, the delivery of IL instructional programmes for inculcating IL competence in undergraduate students. These resources help the teachers to deliver with ease and the learners to learn without stress (Olumorin, Yusuf, Ajidagba and Jekayinfa, 2010). The resources can be classified into learning resources (print-based and digital media), financial and human resources and are expected to be available and accessible for use by the undergraduate students. Moreover, the accessibility of these resources is of essence considering the submission of Osarenren-Osaghae and Irabor (2012) that these resources are more critical in skill-based courses, such as IL. Thus, the acquisition of IL competence requires unhindered access to requisite resources for use by the students. These resources, which are expected to be accessible for utilisation, are to enable the acquisition of IL competence. They include IL educators, instructors and assistants, adequate time allocation for IL instructions, library and information resources on IL, course/learning management system with IL content, ICT laboratories with internet connectivity, library portals, Web 2.0. tools such as YouTube and interactive blogs for answering IL queries, university websites with IL content, and web-based tutorials on IL.

In teaching and learning process, the delivery methods adopted are germane, as they contribute to determine the success or otherwise of the process. The methods of delivering IL instructional programmes, will influence the acquisition of IL competence by the undergraduate students. Be it compartmentalised (separate curriculum) or distributed (course-integrated) approach (Trail and Hadley, 2010), the use of resources are involved through various methods such as orientations, library tours, use of ICT centres, face- to- face lectures in classrooms, hands-on-practices, guidebooks, class discussions, group works, web 2.0 platforms, instructional videos, computer-assisted instructions, PowerPoint presentations, and web-based instruction.

IL programmes are receiving attention in African universities. Ojedokun and Lumande (2005) provided a descriptive analysis of IL programmes at the University of Botswana as credit-bearing courses with full institutional support, which are delivered via the university's WebCT. It is a course management system, and involves lectures, hands-on experience, and assessments. According to them, two of the courses – computing and information skills fundamentals (I and II) are compulsory for all first year students, whereas the other four – information management skills, problem-solving with spreadsheet, web application skills, and multimedia information presentation skills are optional. The IL programme recorded success in the university, but affected other duties in the library, as librarians teaching the courses were also involved in the delivery of other library services.

In four Tanzanian universities, Lwehabura (2008) examined the delivery of IL programmes using 25 librarians and 664 students, and found that the university libraries provide IL training to the students as a stand-alone course with the use of various methods such as lectures, orientation sessions, hands-on practices, and web pages; with findings highlighting a weak assessment and evaluation of the programmes. The IL initiatives in two Ghanaian universities were reported by Dadzie (2009), in which, at the University of Cape Coast, there is a one-credit stand-alone mandatory IL course titled 'Information Retrieval' for all first year students and another on communication skills.

In Morocco, Hassani (2015) documented the IL initiatives of Al Akhawayn University, which is not credit-bearing. In Mohammed VI Library and Multimedia Learning Centre of the University, various methods were adopted by librarians in collaboration with faculty members for implementing IL programmes. The findings indicated that the library-

led IL initiatives in the university could lead to university-wide IL programme, which will integrate IL instructions in the entire curriculum of the university. In Nigeria, Idiodi (2005) compared the standards of practice in developed countries and Nigeria, revealing parallel lines in IL theory and practice between Nigeria and other countries with well-established IL traditions. Rasaki (2008) analysed the IL programmes of three African universities – Federal University of Technology Akure (FUTA), Lagos State University (LASU) and the University of Botswana (UB). The study measured their course outlines against the IL competency standards for higher education by ACRL (2000), and found that FUTA and LASU have compulsory IL courses with one-credit and two-credit units, respectively. However, their course curricular centred on library literacy, whereas that of UB was an exception with contents on IL competences.

Madu (2010) conducted a study on the role of IL in teaching and learning process in a Nigerian university of technology, and identified availability of information resources, qualified IL instructors and adequate training as factors that could facilitate IL. The survey of Nigerian universities by Baro and Zuokemefa (2011) revealed that different IL practices ranging from library tour, orientations sessions to introductory information skills, database searching skills, bibliographic training and use of the library were the IL practices in the universities. The study by Okojie (2012), involving 203 librarians in Nigerian university libraries, showed that librarians' ICT use significantly correlated with their IL skills. In Southwest Nigeria, Adeeko and Ajegbomogun (2013) examined the roles of libraries and librarians in the IL competence of 810 undergraduate students of three universities, and found that emphasis is on library literacy, as only one of the three universities has IL instruction as a credit course; there were poor and inadequate resources for IL instruction, low level of adoption and use of computer-assisted IL instruction, and deficiencies in methods of IL instruction.

The study in twelve university libraries located in South-west, Nigeria by Ukachi (2015) found that the students had poor IL skills, which correlated with their low use of electronic information resources. Similarly, at the University of Ibadan, Nigeria, Adeleke and Emeahara (2016) found a significant but weak correlation between IL and use of electronic resources for academic purposes by postgraduate students. Although the findings revealed that the postgraduate students perceived their IL skills high, their use of electronic information resources was found to be low, which was attributed to lack of awareness of the resources availability and accessibility, as well as poor search techniques.

The justification for this study was therefore hinged on the appraisal of the literature review, which revealed that none of the reviewed studies specifically addressed the effects of resources accessibility and delivery methods on the IL competence level of undergraduate students in Southern Nigerian universities. This is the gap filled by this study.

Methodology

The survey research design of the correlational type was adopted. The population is 39,338, which is the total number of final year undergraduate students in the nine selected Southern Nigerian universities as contained in Table 1. The multistage sampling was adopted in selecting the target group for the study and was carried out in stages, using sampling techniques at each stage. There were 78 universities (18 owned by the Federal, 22 by the states and 38 privately-owned) in Southern Nigeria, out of the 129 universities in Nigeria (NUC, 2013). The first criterion used was the selection of a first generation university from the three categories in each of the three geopolitical zones that made up Southern Nigeria. First generations of the three categories were ascertained as follows: first generation federal universities (1948-1969), first generation state universities (1979-1989), and first generation private universities (1999-2005).

Consequently, three universities (federal, state and private-owned) were purposively selected from each geopolitical zone for fair representation. Meanwhile, deliberate efforts were made not to select more than one university from the same state in a geopolitical zone. South-South geopolitical zone does not have a first generation federal university, so a second generation federal university (established

between 1970 and 1985), i.e. the University of Calabar, established in 1975, was selected and used as a replacement. The University of Benin, established in 1971, which would have been selected in place of University of Calabar, falls into the same Edo State with Igbinedion University, Okada and Benson Idahosa University, Benin, which are the only two first generation private universities in South-South geopolitical zone. So, the choice of the University of Calabar for South-South zone was considered appropriate.

The final selection therefore included University of Nigeria, Nsukka, Enugu State (Federal, South-East); Abia State University, Uturu, Abia State (State, South-East); Madonna University, Okija, Anambra State (Private, South-East); Obafemi Awolowo University, Ile-Ife, Osun State (Federal, South-West); Ekiti State University, Ado-Ekiti, Ekiti State (State, South-West); Covenant University, Canaan Land, Ota, Ogun State (Private, South-West); University of Calabar, Cross River State (Federal, South-South); River State University of Science and Technology, Port Harcourt, River State (State, South-South); and Igbinedion University, Okada, Edo State (Private, South-South). The selection of these first generation universities were considered appropriate for the study because they are mature universities, and should have consolidated very well in their IL programmes for the training of information-literate graduates for the society.

The second criterion in the multistage sampling was that the study focused on the final year undergraduate students in the selected universities; given their past academic experience in courses and programmes on IL instruction or user education offered by librarians in their universities for inculcating IL competence. Majority of these students were in 400, 500 or 600 levels, as the case may be. Thus, they should therefore be able to ascertain the extent of accessibility of resources to them for acquisition of IL competence, the delivery methods used for IL instructions, and their attitude towards IL instructions. Through stratified sampling, 5% were selected from all the faculties of the nine universities that constituted the total number of final year undergraduate students in 2014/2015 academic session. This resulted in 1,967 as the sample size. Details of the sample of the final year undergraduate students in the selected universities are presented in Table 1. The same technique was used by Ukachi (2013) and Abubakar and Adetimirin (2015). The questionnaire and IL competence test were the major instruments used for data collection, which were developed after thorough review of related and relevant literature by the researcher. The questionnaire was drafted using five-point Likert scale for the independent variables, whereas a 20-item test was used to establish the level of IL Competence of the undergraduate students. In order to ascertain the actual IL competence of the undergraduate students in Southern Nigerian universities, a 20-item test tagged 'IL Competence Test' was administered alongside the questionnaire to the respondents.

Each test item had option A – D, with one correct option and other three wrong options. Any test item answered correctly attracted 5 points. This means that the 20-items will result to 100%, if answered correctly. However, any test item with wrong answer attracted zero (0) point. The instruments were validated by experts, and test-retest reliability with Pearson Product Moment Correlation (PPMC) yielded $r = 0.87$ as the average coefficient, which shows that the instruments are dependable for the study. Frequency counts and percentages were used to answer the research questions, whereas Spearman Rank Order Correlation was used to test the two null hypotheses at 0.05 level of significance.

Table 1: Population and Sample of Final Year Undergraduate Students

Geo-Political Zone	University and Year of Establishment	Ownership	Final Year Students in the selected universities (2014 2015) Session	Sample (5%)
South-East	University of Nigeria Nsukka, Enugu State – 1960	Federal	7,683	384
	Abia State University, Uturu, Abia State – 1981	State	5,927	296
	Madonna University Okija, Anambra State – 1999	Private	1,432	72
South-South	University of Calabar, Calabar, Cross River State – 1975	Federal	4,786	239
	Rivers State University of Science and Technology, Port Harcourt, Rivers State – 1979	State	4,395	220
	Igbinedion University, Okada, Edo State – 1999	Private	2,487	124
South-West	Obafemi Awolowo University, Ile-Ile, Osun State – 1962	Federal	5,694	285
	Ekiti State University, Ado-Ekiti, Ekiti State (formerly University of Ado-Ekiti) – 1982	State	4,978	249
	Covenant University Ota, Ogun State – 2002	Private	1,956	98
Total			**39,338**	**1,967**

Data Analysis and Findings

A total of 1,967 copies of the questionnaire were distributed, with 1,736 (88.2%) copies returned, and 1541 (78.3%) found to be properly completed and used for data analysis. This was considered adequate for similar studies are 60% (Dulle, Minish-Majanja and Cloete, 2010). The demographic characteristics of the respondents revealed 782 (51%) females and 759 (495) males; 604 (39%) were from social and management sciences; 485 (32%) from science and technology; and 452 (29%) from humanities and arts. Along university type, 697 (45%) were from federal owned, 613 (40%) state-owned; and 231 (15%) privately-owned.

RQ1: What is the extent of resources accessibility by undergraduate students for acquisition of IL competences in Southern Nigerian universities?

Findings on the extent of resources accessible to undergraduate students for the acquisition of IL competence are presented in Table 2.

Table 2: Extent of Accessibility of Resources and Acquisition of IL Competence (N = 1541)

S/N	Extent of Accessibility of Resources	HNA 1	NA 2	U 3	PA 4	HA 5
1.	Information literacy educators and instructors (librarians)	93	312	205	496	435
		6.0%	20.2%	13.3%	32.2%	28.2%
2.	Teaching Assistants for information literacy programmes	232	167	402	373	367
		15.1%	10.8%	26.1%	24.2%	23.8%
3.	Adequate time allocations for information literacy instructions	110	323	311	485	312
		7.1%	21.0%	20.2%	31.5%	20.2%
4.	Conducive library environment with requisite resources	82	105	190	604	560
		5.3%	6.8%	12.3%	39.2%	36.3%
5.	Course/learning management system with information literacy content	195	313	432	310	291
		12.7%	20.3%	28.0%	20.1%	18.9%
6.	ICT laboratories for information literacy programmes	146	217	309	403	466
		9.5%	14.1%	20.1%	26.2%	30.2%
7.	Internet connectivity and hotspots	120	224	262	386	549
		7.8%	14.5%	17.0%	25.1%	35.6%
8.	University website with content on information literacy	228	288	235	397	393
		14.8%	18.7%	15.2%	25.8%	25.5%
9.	Library portals on information literacy skills	203	230	366	365	377
		13.2%	14.9%	23.8%	23.7%	24.5%
10.	Web-based tutorials and links on IL	273	397	194	415	262
		17.7%	25.8%	12.6%	26.9%	17.0%
11.	Interactive Web 2.0. tools such as blogs for IL queries	302	455	295	308	181
		19.6%	29.5%	19.1%	20.0%	11.7%
12.	Textbooks on information literacy and user education	101	143	251	578	468
		6.6%	9.3%	16.3%	37.5%	30.4%
13.	Workbooks for information literacy programmes	196	252	458	409	226
		12.7%	16.4%	29.7%	26.5%	14.7%
14.	CD-ROM databases on information literacy	221	305	373	378	264
		14.3%	19.8%	24.2%	24.5%	17.1%
15.	Projectors for information literacy instructions	155	260	346	447	333
		10.1%	16.9%	22.5%	29.0%	21.6%
16.	Information literacy policy documents and frameworks	173	379	408	379	202
		11.2%	24.6%	26.5%	24.6%	13.1%
17.	User guides for information literacy programmes	171	328	365	429	248
		11.1%	21.3%	23.7%	27.8%	16.1%
18.	Video tapes and streaming video for IL instructions	323	390	281	286	261
		21.0%	25.3%	18.2%	18.6%	16.9%
19.	Active learning classrooms for IL instructions	122	135	278	561	445
		7.9%	8.8%	18.0%	36.4%	28.9%
20.	Conducive learning environment	90	198	216	591	446
		5.8%	12.8%	14.0%	38.4%	28.9%

Key: HNA – Highly Not Accessible; NA – Not Accessible; U – Undecided;
PA – Partly Accessible; HA – Highly Accessible

Table 2 revealed that most of the resources were accessible to the respondents for the acquisition of IL competence. The resources with high accessibility rate were conducive library environment with requisite resources (75.5%), textbooks on information literacy and user education (67.9%), conducive learning environment (67.3%), active learning classrooms for IL instructions (65.3%), Internet connectivity and hotspots (60.7%), as well as IL educators and instructors (60.4%).

Those with poor accessibility rate include workbooks for IL programmes, user guides for IL programmes, course/learning management system with IL content. Video tapes and streaming video for IL instructions and interactive Web 2.0 tools such as blogs for IL queries, which have poor percentage, were not readily accessible for use. The interactive web 2.0 tools such as blogs and associated social media platforms as well as streaming video are digital-based resources that would have attracted them; thus contributing to their level of competence, if deployed for IL instructions.

RQ 2: What are the delivery methods used for IL instructions in Southern Nigerian universities?

Table 3: Delivery Methods used for IL Instructions in the Universities (N=1541)

S/N	Delivery Methods	HNU 1	NU 2	U 3	OU 4	HU 5
1.	Orientation about available resources and services	181	199	292	506	363
		11.7%	12.9%	18.9%	32.8%	23.6%
2.	Library tour for on-the-spot access to resources	306	263	215	447	310
		19.9%	17.1%	14.0%	29.0%	20.1%
3.	Face-to-face lectures in classrooms	89	123	119	516	694
		5.8%	8.0%	7.7%	33.5%	45.0%
4.	Hands-on-practice in library	133	336	409	377	286
		8.6%	21.8%	26.5%	24.5%	18.6%
5.	Use of ICT laboratories	310	309	309	427	186
		20.1%	20.1%	20.1%	27.7%	12.1%
6.	Guidebooks, workbooks and leaflets	121	374	392	372	282
		7.9%	24.3%	25.4%	24.1%	18.3%
7.	Group tasks and works	125	291	260	509	356
		8.1%	18.9%	16.9%	33.0%	23.1%
8.	Class discussions	129	138	216	608	450
		8.4%	9.0%	14.0%	39.5%	29.2%
9.	Social media and web 2.0 tools for instructions	474	374	233	269	191
		30.8%	24.3%	15.1%	17.5%	12.4%
10.	Power point presentation of lectures	360	468	239	283	191
		23.4%	30.4%	15.5%	18.4%	12.4%
11.	Instructional video and films display	362	434	282	262	201
		23.5%	28.2%	18.3%	17.0%	13.0%
12.	Websites and interactive web-based tutorials	613	485	185	136	122
		39.8%	31.5%	12.0%	8.8%	7.9%
13.	Content display from CD-ROM databases	501	395	410	128	107
		32.5%	25.6%	26.6%	8.3%	6.9%
14.	Take home tests	167	242	323	447	362
		10.8%	15.7%	21.0%	29.0%	23.5%
15.	Practical assignments	150	165	325	457	444
		9.7%	10.7%	21.1%	29.7%	28.8%
16.	Assessment tests and unannounced quizzes	143	194	205	625	374
		9.3%	12.6%	13.3%	40.6%	24.3%
17.	End of semester assessments and examinations	51	127	135	521	707
		3.3%	8.2%	8.8%	33.8%	45.9%
18.	Feedback evaluation forms after lectures	309	308	389	387	148
		20.1%	20.0%	25.2%	25.1%	9.6%
19.	Impact assessment in relation to learning outcomes and students' academic performance	216	261	535	304	225
		14.0%	16.9%	34.7%	19.7%	14.6%
20.	University-wide students' information literacy needs assessment	352	504	344	223	118
		22.8%	32.7%	22.3%	14.5%	7.7%

Key: HNU – Highly Not Used; NU – Not Used; U – Undecided; OA – Occasionally Used; HU – Highly Used

As presented in Table 3, the methods mostly used were face-to-face lectures in classrooms (78.5%) and end of semester assessments and examinations (79.7%). Delivery methods hardly used or not used at all included use of ICT laboratories (39.8%), feedback evaluation forms after lectures (34.7%), PowerPoint presentation of lectures (30.8%), instructional video and films display (30%), social media and web 2.0 tools for instructions (29.9%), university-wide students' IL needs assessment (22.2%), Websites and interactive web-based tutorials (16.7%), and content display from CD-ROM databases (15.2%).

RQ 3: What is the level of IL competence of undergraduate students in Southern Nigerian universities?

Table 4 shows the level of IL competence of the respondents. The table reveals that only in items 12 and 17 did the respondents score up to 42% and 46% respectively, slightly above the 40% pass mark. This implies that the respondents' actual level of IL competence is very low in their scores in all the 20 test items.

Table 4: Level of IL Competence of Undergraduate Students (N =1541)

Item	Correct	% Correct	Wrong	% Wrong
1.	496	32	1045	68
2.	507	33	1034	67
3.	454	29	1087	71
4.	363	24	1178	76
5.	417	27	1124	73
6.	503	33	1038	67
7.	498	32	1043	68
8.	419	27	1122	73
9.	372	24	1169	76
10.	398	26	1143	74
11.	520	34	1021	66
12.	**653**	**42**	888	58
13.	444	29	1097	71
14.	564	37	977	63
15.	414	27	1127	73
16.	372	24	1169	76
17.	**705**	**46**	836	54
18.	448	29	1093	71
19.	523	34	1018	66
20.	319	21	1222	79
MEAN	**469**	**30 %**	**1072**	**70%**

$H0_1$: There is no significant relationship between resources accessibility for acquisition of IL competence and IL competences of undergraduate students in Southern Nigerian universities.

Table 5: Correlation Analysis on Accessibility of Resources for Acquisition of IL Competence and IL Competence of the Respondents

			Resources Accessibility	Info. Literacy Competence
Spearman's rho	Accessibility of Resources	Correlation Coefficient	1.000	.919**
		Sig. (2-tailed)	.	.000
		N	1541	1541
	Info. Literacy Competence	Correlation Coefficient	.919**	1.000
		Sig. (2-tailed)	.000	.
		N	1541	1541

**. Correlation is significant at the 0.05 level (2-tailed

As seen in Table 5, a Spearman Rank-order Correlation test revealed a value of rho=0.919 indicating a very strong and positive correlation between resources accessibility and IL competence of the undergraduate students. The null hypothesis is rejected as there was a significant relationship between resources accessibility and IL competence of undergraduate students, implying that the extent of resources accessible for use by the undergraduate students determines their level of IL competence.

$H0_2$: There is no significant relationship between delivery methods used in IL instructions and IL competences of undergraduate students in Southern Nigerian universities.

Table 6: Correlation Analysis on Delivery Methods Used in IL Instructions and IL Competence of the Respondents

			Delivery Methods	Info. Literacy Competence
Spearman's rho	Delivery Methods	Correlation Coefficient	1.000	.919**
		Sig. (2-tailed)	.	.000
		N	1541	1541
	Info. Literacy Competence	Correlation Coefficient	.919**	1.000
		Sig. (2-tailed)	.000	.
		N	1541	1541

**. Correlation is significant at the 0.05 level (2-tailed)

The output of a Spearman rank-order Correlation test (Table 6) , revealed a value of rho=0.919, indicating a very strong and positive correlation between delivery methods and IL competence of the undergraduate students. The null hypothesis is therefore rejected as there is a significant relationship between delivery methods and IL competence of undergraduate students, implying that the nature of instructional methods used for IL instructions determines the level of IL competence which the undergraduate students acquire in Southern Nigerian universities.

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Discussion of the Findings

The findings revealed that most of the resources were accessible for the acquisition of IL competences, with some not available, particularly the digitally- based. However, the inability of the students to have access to instructional video for IL programmes and interactive Web 2.0. tools such as blogs for IL queries affected their level of IL competence. This finding contradicts the advocacy for information literacy 2.0 by Godwin (2009) and Koltay, Spiranec and Karvalics (2015), thereby presenting the strategic importance of web 2.0 tools as resources for IL instructions that need not be taken for granted in this digital era.

The usual face-to-face lectures in classes, class discussions, assessment tests and quizzes, practical assignments, and end of semester examinations dominated the instructional methods used for IL programmes in the universities. There were also other methods such as orientation about available information resources and services, group tasks, take home tests, hands-on practices, guidebooks, workbooks and leaflets, and tours in the library for on-the-spot access to resources. This concurs with the findings of Kiondo and Msuya (2005) that lectures, hands-on practice and assessments, among others, were the major methods of delivering IL programmes in many universities in Eastern, Central and Southern Africa, but with the exception of Rand Afrikaans University, South Africa and University of Botswana which deliver the programme through the web in virtual learning environment.

Meanwhile, the findings also indicated that most contemporary delivery methods such as visit and use of ICT laboratories, PowerPoint presentation of lectures, instructional videos and films display, social media and Web 2.0 tools for instructions, content display from CD-ROM databases, websites and interactive web-based tutorials were not used as delivery methods during IL instructional programmes in the universities in Southern Nigeria. This is in line with the findings of Baro and Zuokemefa (2011), Baro, Semode and Godfrey (2013), and Adeeko and Ajegbomogun (2013), which reported low use of computer-assisted instructions and poor acceptance of online IL delivery approach as factors affecting IL programmes in Nigerian universities.

The inability to apply delivery methods that involve ICTs, social media tools, websites and interactive web-based tutorials, which are student-centred, affected the level of IL competence of the undergraduate students, as corroborated by Oyibe and Nnamani (2014) whose findings revealed that students prefer learner-centred instructional methods that involve their active participation in the teaching and learning process. On the actual IL competence of the respondents, using a 20-item test, results established poor and low IL competence, in line with the reports of such earlier studies as those of Igwe and Ndubuisi-Okoh (2014), Ukachi (2015) and Onuoha and Molokwu (2016), which provided background to the problem of the study in Southern Nigeria.

Furthermore, this finding of poor IL competence among students justifies the argument of Badke (2008) that the nature of IL programmes within higher education is failing to meet its intentions of becoming credible within the academic community and pervasive within university programmes. That is why Aina (2014) lamented that core library and information services, including IL programmes, are either rarely provided to users or of low quality when

provided in Nigerian universities. The test of significance showed that there is a significant relationship between resources accessibility and IL competence, implying that the extent of resources accessible and used by the undergraduate students will determine their level of IL competence. This finding agrees with that of Gunn and Miree (2012) at Oakland University, Michigan, USA, where easily accessible resources such as online IL tutorials, instructional videos, active learning exercises, and content of IL competency standards for higher education were combined for IL programme, and resulted in imparting the skills effectively in students. The report of Ogunniyi and Nwalo (2015), where the extent of resources accessed and utilised correlated with the level of academic achievement of undergraduate students of LIS schools in Southern Nigerian universities, also supports this finding.

There was also a very strong, positive and significant relationship between delivery methods used in IL instructions and IL competence of the undergraduate students, showing that the delivery methods adopted during IL instructions will determine the level of IL competence to be acquired. This positions the delivery method as a determinant factor of the IL competence level of the students. This finding is in line with that of Arinde (2010), which revealed that there is a significant relationship between computer-aided instructions and academic performance of students. This situation is not different from the report of Shaari, Sidek and Badzri (2012), at the University of Kebangsaan, Malaysia, where a developed module of IL course, with evaluated content to ascertain the learning outcome and students' academic performance, achieved over 75% students' satisfaction in acquiring the required IL skills.

Conclusion and Recommendations

This study concluded that the accessibility of resources for use and delivery methods adopted during IL instructions are factors responsible for poor level of IL competence of undergraduate students in Southern Nigerian universities. The study therefore recommended that:

- Since resources are central to all educational programmes, there is need for the universities to ensure adequate provision of requisite, relevant and 21st century-based resources for IL programme and acquisition of IL competence by the students.
- The universities studied should strengthen their online pedagogic facilities to accommodate effective IL instructions, consider adoption and use of web-based IL instructional methods for the delivery and engage the services of more IL educators.
- The university authorities in Southern Nigeria should collaborate with the National Universities Commission (NUC) to integrate feedback evaluation, impact assessment, and students' IL needs assessment and measurement techniques to ascertain that IL programmes achieve pre-determined purpose among undergraduate students.
- The universities studied should establish a directorate tagged Centre for Information Literacy Education (CILED), for coordination of IL programmes, to be strategically placed under the office of the Vice-Chancellor, but be expected to collaborate with the university library in executing its functions.

1. The NUC should develop IL competency standards for implementation of IL programmes in Nigerian universities.

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The Role of Records Management in Small Micro and Medium Enterprises (SMMEs) in South Africa and Its Implications for Business Sustainability

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Abstract

The study investigated the nature of records management (RM) in enhancing small, micro and medium enterprises (SMMEs) sustainability in South Africa. Indubitably, RM practices play a crucial role in supporting business return on investment, sustaining business decision making, and improving sustainable business management. The study adopted a case study; purposive sampling techniques and in-depth interviews were conducted to gather data from 23 SMMEs in Nkonkobe Municipality. The findings indicated that despite enormous contribution of the SMMEs to the South African economy, no actual RM policy existed to guide them in their business processes, and how business records should be managed and preserved. The findings revealed that SMMEs are yet to profit from the return on investment RM offers. Their inability to maintain business records serves as hindrance to access to credit facilities, especially from banks. The SMME owners or managers lack skills to manage their business records, and this has affected their output and productivity. The researchers recommended that the RM guiding principles should be incorporated by the SMMEs as the big companies utilise it, and this can help small businesses too if they are adapted to meet their local needs. The RM principles can be embedded through automation by designing SMME-specific RM systems, such as service-oriented design, to aid both manual and electronic RM.

Keywords: Records Management, Records Management Policy, SMMEs Sustainability, Records Life cycle, Return on Investment.

Introduction

In the European Union (EU), it was reported that the small micro and medium enterprises (SMMEs) ability to maintain records management (RM) was necessary for their operations, including efficient access to records that led to improved service delivery (Webster, Hare and McLeod, 1999). In Europe, it was highlighted that overall performances of businesses that kept records were enhanced compared to those that failed to adopt proper records management. This proper RM practices, in part, might have explained the reasons why the 34 countries in the Organisation for Economic Cooperation and Development (OECD) in the EU member states and beyond have had so many successful SMMEs.

Inarguably, the importance and significance of SMMEs were documented by Lukacs (2005). These findings by Lukacs in 2005 showed that 19.3 million existing small businesses were contributing significantly to the EU economy, providing above sixty-five million jobs. In New Zealand, 98% of its current businesses are categorised as SMMEs (Lawrence, Collins, and Pavlovich, 2006). In most of the EU member states, SMMEs maintain 'considerable' records management practices and even utilise information technology (IT) to optimise their records keeping (Webster and Hare, 1999; Borglund et al., 2009). SMMEs in the UK, for example, have realised that RM is the third most important for business improvement after

management and training (Webster and Hare, 1999).

A study by Kemoni (2009) indicated that most countries in the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) region lack the capacity for effective records management. It was reported that a lack of training capacity and awareness among records keeping personnel and unavailability of infrastructure are obstacles to effective records management. Fatoki and Van Aardt Smit (2011) found that record keeping is among the challenges facing SMEs and SMMEs in South Africa. Moreover, if the business operation lacks the required skills, it will impede their ability to transfer required knowledge to other employees (Ajibade, 2016) because it is necessary for the small businesses to be able to transfer their knowledge, either, RM or through any other business knowledge.

Several findings have indicated varying degrees of a lack of required knowledge and professional skills in RM. These challenges are present in the public, corporate and most business enterprises, where unqualified personnel are employed to act as records managers without being trained (Khayundi, 2011). According to Fripp (2013), ineffective management of business records could result in operational problems including low or loss of productivity, lack of business direction, decreased efficiency and tilting profitability. Many efforts have generated empirical studies in the ESARBICA region to strengthen e-records management capacity building and promote public records management (Ngulube and Tafor, 2006; Tough and Kemoni, 2009; Wamukoya and Mutula 2005) and e-records management is increasing in the ESARBICA region due to technological advancement. Digital or e-records management in South Africa has been gaining empirical momentum (Katuu and Ngoepe 2015), but earlier studies focused on public institutions and agencies. However, South Africa Government recognises the vital role and contributions of the business institutions, particularly the small and medium enterprises (SMEs), and this has mandated the government to create a Ministry of Small Business Development. But, findings by Ajibade (2015) on the records management practices among SMMEs identified that SMMEs were faced with the "inability to create file plan and maintained business records descriptions." It was indicated that there was a lack of RM knowledge among the SMMEs, as most SMMEs lack the necessary skill of RM which is required for business operations (Ajibade, 2015). This lack of RM ability is consistent with the findings of Okello-Obura (2012) conducted on SMEs E-records and Khayundi (2011) studies carried out on public institutions. Findings by Ajibade (2015) suggested that economic contributions of SMMEs in South Africa were above 45%, but there are huge gaps in literature to document SMMEs records management in South Africa.

This study adopted records life cycle and continuum models to depict the life of a record during its current, semi-current and non-current stages. Records life cycle is the systematic and logical movement of a record from creation, maintenance, use, storage, retrieval, retention and disposal (Zawiya and Chell, 2000; Dick, 2011; Hoke, 2011; IRMT, 2013; McLeod, 2005).

Problem Statement

SMMEs, in an ideal business milieu, must be able to maintain records that are created or received as evidence of business transactions. In South Africa, the SMMEs failure rate was estimated at 75 per cent, ranking among the highest in the world (Brink, Cant, and Ligthelm, 2003; Fatoki and Van Aardt Smit, 2011). Among the contributing factors to this failure are poor records management and lack of access to finance. Fatoki and Van der Mart (2011) had raised concern in passing that lack of records, and information asymmetry had prevented the small businesses in South Africa from securing loans to finance their operations. Findings revealed that in the advanced economy such as Europe, SMMEs are maintaining records for administrative, operational and legal compliance purposes (Webster, Hare, and McLeod, 1999; Borglund, Anderson, Sirkemaa, Wahlberg, and Sandberg, 2009). But there were limited data to document South African SMMEs RM practices that showed their compliance and records managements either for financial or for operational decisions. It might be that the SMMEs are not aware of the importance of RM to their business operations. Study conducted in Uganda revealed that majority of SMMEs failed to comply with RM legal requirements (Tushabomwe-Kazooba, 2006).

However, Ajibade (2015) revealed that records management practices by small businesses in South Africa have not been explicitly researched (Ajibade, 2015). Several queries on "SMMEs RM in Africa were also carried out on Google Scholars with various search techniques such as term-masking and Boolean methods with different search phrases. Only 12 results were retrieved, but most of the findings were not on SMMEs RM practices. Most of the studies did not focus on SMMEs RM, but either mention in-passing, RM or SMMEs inventory management automation (Mbuvi, Namusonge and Arani, 2016), and this lack of data further justified there is a lack of sufficient empirical studies specifically conducted on SMMEs RM practices. Other studies mentioned in passing, SMEs record, while others have concentrated on personnel RM, and public institutions (Khayundi, 2011; Moatihodi and Kalusopa, 2016). Since 2015, South African Government established the Ministry of Small Business Development; yet, there have not been empirical studies to report the nexus between SMMEs and RM practices. Presently, there is a lack of literature that highlights importance of RM by the SMMEs in South Africa, and this concern further justifies the need for research on this subject in South Africa.

Research Questions

The main aim of this study was to investigate the role of records management in small, micro, and medium enterprises and its implication for their sustainability.

The following research questions guided the study.

- What are the educational levels of the SMMEs managers?
- What records management skill/training do the SMMEs possess?
- What types of records are generated and maintained by SMMEs in South Africa?
- What records management practices are adopted by the SMMEs in South Africa?
- What is the importance of RM to SMMEs businesses in South Africa?

Research Method

The study site was Alice and Fort Beaufort business districts in the Nkonkobe local Municipality. The study was carried out from 2014 and was finalised in 2015.

The study adopted a multi-case approach at Nkonkobe Municipality. The SMMEs at Alice and Fort Beaufort served as the study population. This multi-case approach was adopted by other researchers on related subjects in this field (Ajibade, 2015; 2016; Munetsi, 2012; Ngulube, 2003). It was important to understand the views, opinions, values, and knowledge of SMMEs managers on RM (Leedy and Ormrod, 2010; Welman, Kruger and Mitchell, 2010 and Hales 2010), especially since this study was exploratory in nature to establish the SMMEs RM practices. The study adopted purposive sampling techniques to select respondents that the researcher believed could supply needed information in the study area. Purposive sampling techniques provided the researcher authority to use his/her knowledge of the subject matter and the study area to locate respondents that can supply rich information.

The data were collected through in-depth interviews with 23 businesses and field observations (Babbie, 2010) which were deemed suitable (Ajibade, 2016; Durst and Edvardsson, 2012; Welman *et al.*, 2010). The sample size was not a problem as the study was concerned with depth of understanding rather than genralisation of findings. This is consistent with interviews where emphasis was made on rich data, and it was argued that fewer respondents will be needed to reach point of saturation (Morse 2000). Hence, the interviews reached the point of saturation after the 21st respondent but the interview continued until the 23rd respondent and at this point; there were no new information, which was the saturation point to avoid repetition. Kele, Mohsin and Lengler (2017) studies reported that their interviews reached saturation point at the 22nd respondent; hence, their interviews total sample size were 22 respondents. The choice of in-depth interviews in this study was justified by the need for rich data and in-depth insights rather than an attempt to generalise the findings for examining the role of RM in SMMEs. Interviews lasted for twenty minutes where there was no customer's interruption, but approximately twenty-five minutes where there were interruptions or pulse during the interviews. Twenty-three SMMEs owners

or managers were interviewed. The rationale behind the choice of the business managers' selection was the fact that some of the owners were not the ones managing the business but appointed business managers. The Statistical Package for Social Sciences (SPSS) software version 20.1 decision tree was used to find patterns in the interviewee's responses. The interviews were transcribed and categorised into themes based on the research questions.

Result and Discussions

Educational Background:

The educational level of the people engaged in one activity or the other as managers/owners or one of the employees might influence their ability to maintain business records and improve RM practices. It was necessary to find out whether the respondents' level of education had any influence on their decision to maintain records in their businesses. The data indicated that 91.3% had one form of formal education or the other ranging from primary stage 4.3%, secondary 17.4%, grade 12/ matric 39.1%, university/diploma 26.1%, and others 4.3%. However, for 8.7%, the educational background could not be confirmed; this was classified as missing data. Figure 1 below presents the details of the analysis.

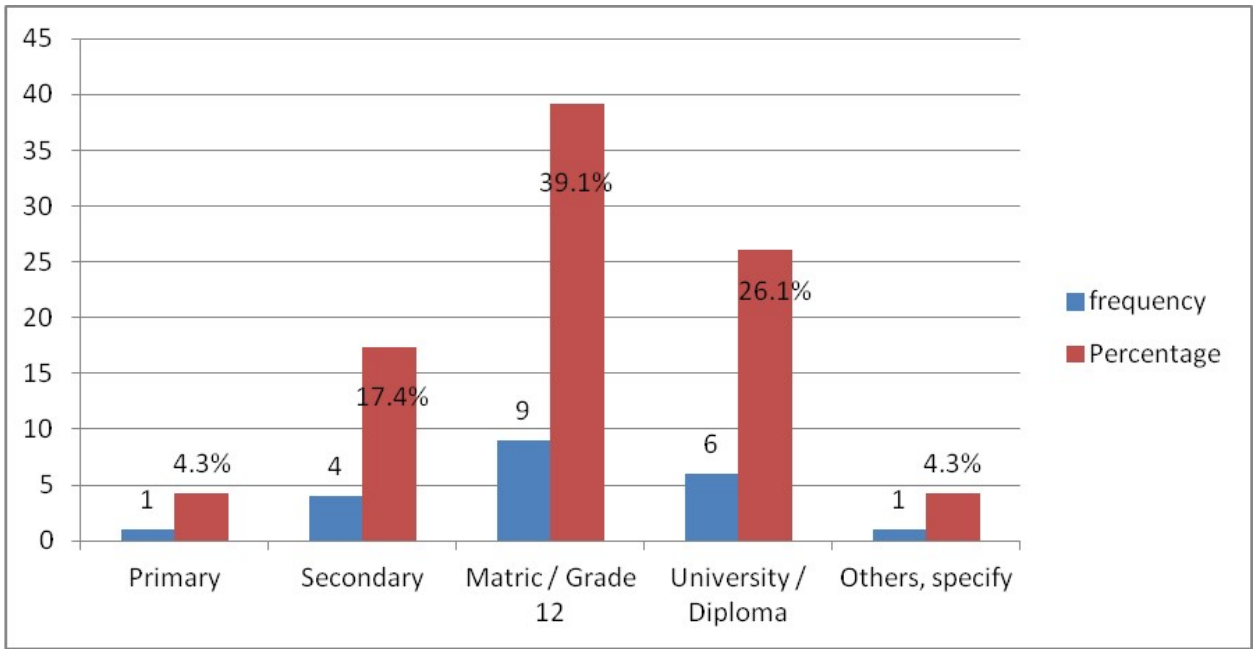

Figure 1: Educational Background

It was anticipated that based on levels of education, the respondents would be able to understand the importance of maintaining records. Unfortunately, educational background of the SMMEs did not increase the way their business records were managed, although Bowen, Morara, and Mureithi (2009) indicated that SMEs with access to formal education improve their performances of business activities. In contrast, level of education of these respondents had not increased/improved their RM practices based on lack of RM skills and inability to maintain business records, as indicated in the next section of the paper below. However, it is possible that the SMMEs lack of RM practices may be because RM is a specialised skill that requires professional trainings.

Records Management Skills

It was important to confirm if the SMMEs managers possess skills or training that enabled them to manage business records. SMMEs managers need RM skill

in order to create, maintain, classify, use, store, retrieve and dispose business records in an efficient way. The respondents were asked if they had any skill or training in records keeping. One (4.3%) respondent said "*I have an idea and knowledge on how to manage records*", while twenty (87%) of the respondents said that they did not have any training or skills in RM or in managing business records, but two (8.7%) SMMEs managers did not respond. One of the respondents who said she did not have training said that, "*all the employees look after their business records and none of them have any training on RM".* The findings below presented responses from 12 business owners and 11 managers.

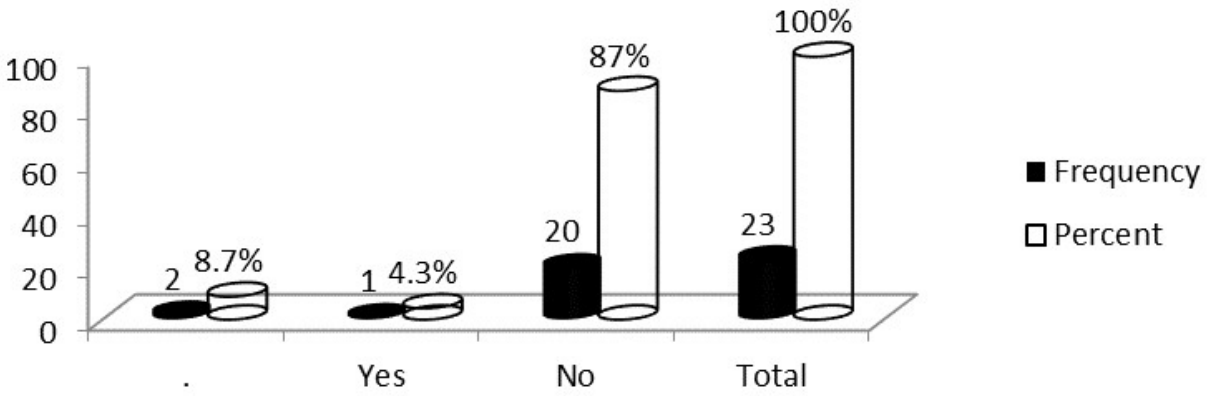

Figure 2: Training on records keeping; n=23

Training in managing business records helps in supporting decision making. Training is important in order to establish whether SMMEs managers running the business had the necessary skills and training in keeping records of business transactions. The only person who said she had knowledge of records keeping was referring to concept from accounting principle which gave her a clue of what records management meant as she studied accounting in school, but she had no records management training.

The respondents were asked if they thought it was important to receive training on how to manage records. Many of the respondents said that it was important to have training regarding business records management and some of their responses were captured below:

> *It is important, because if someone could show us the better ways of managing our records, it would empower us to better look after our businesses the proper way.*

The responses given below were gathered from two of the interviewees:

> *(The first respondent) "It is important, because we have lay-by and we use the records to monitor that lay-by progression (how much have been paid, what is left to be settled, we are only using our idea to write what is happening, if we can learn other better ways through training it will be better."*
>
> *(The second respondent) "it is better for me but there is limited knowledge about how to manage the records, and there is no chance but it would be better to be trained while in the shop because there is no chance to go out; if somebody can train me better I think it would be very good for my business and I would be in a position to do my books in a better way."*

The researcher believed that those who have demonstrated little knowledge about keeping records used ideas cultivated from their educational background. This might have taught them the importance of maintaining records. It appeared that

none of the people interviewed either (SMMEs owners or employees) had received any training on how to manage records. It could be argued that none of them had any idea of what it requires to set up a records management programme. Yet, different types of records in business organisations have diverse benefits and economic importance. In South Africa, SMMEs seem to be lacking essential/basic training in RM. It appears that the SMMEs might continue to have problems related to a lack of sound RM systems, especially if those who are running SMMEs are not trained in the basic records management.

Training provides professional overview of the required knowledge that helps SMMEs to explore current practice. Okello-Obura (2012) based on the study conducted in Uganda, identified that small businesses lack appropriate training and skills in managing records. Chiware and Dick (2008) reiterated that it was important for SMMEs to get available help and advice on improving their management of financial records. The study established that SMMEs were not able to maintain or establish demarcation in their personal finances and business spending, as most of them indicated that they kept all their records together.

Types of Records Maintained by the SMMEs

The SMMEs owners and managers interviewed were asked if they maintained business records. Thirty-nine per cent (39%) of the SMMEs indicated that they were keeping business records, but this was contrary to the actual scenario based on the types of records available (see figure 3). As a follow-up question, the respondents were asked if they were aware of what is known as RM life cycle, but none of the respondents knew what a record life cycle is. The theoretical framework dictates that business records processes be managed systematically from the creation to the final disposal. This is essential for business organisations' performances and sustainability. Judging from the types of records the SMMEs were keeping, their responses on records classification, and the lack of RM training and skills which constitute vital records management practices, it can be stated that the SMMEs lack RM practices. The SMMEs lack of training, skill and basic RM knowledge simply indicated that they were not familiar with the life cycle concept and their responses showed that there was no systemic management of business records. Nevertheless, the life cycle and continuum require systematic management of records from creation to final disposition. These SMMEs records management practices cannot be compared with the practices in developed countries where it was reported that the SMMEs had adopted systemic RM for their companies' operations, as supported by findings that the European SMMEs viewed RM as essential practices for their business stability and improved performances (Webster, Hare, and McLeod, 1999). These findings clearly show that there appears to be wide gaps between how business records were maintained in the developed economies in contrast to SMMEs in South Africa. The respondents were further asked to state or describe the types of records or books they were keeping, and based on their responses, seven categories or types of records were identified as indicated in (figure 3). However, the SMMEs that their records were categorised as "general document" used the same document to capture sales recordings, and for customer's contact detailed information.

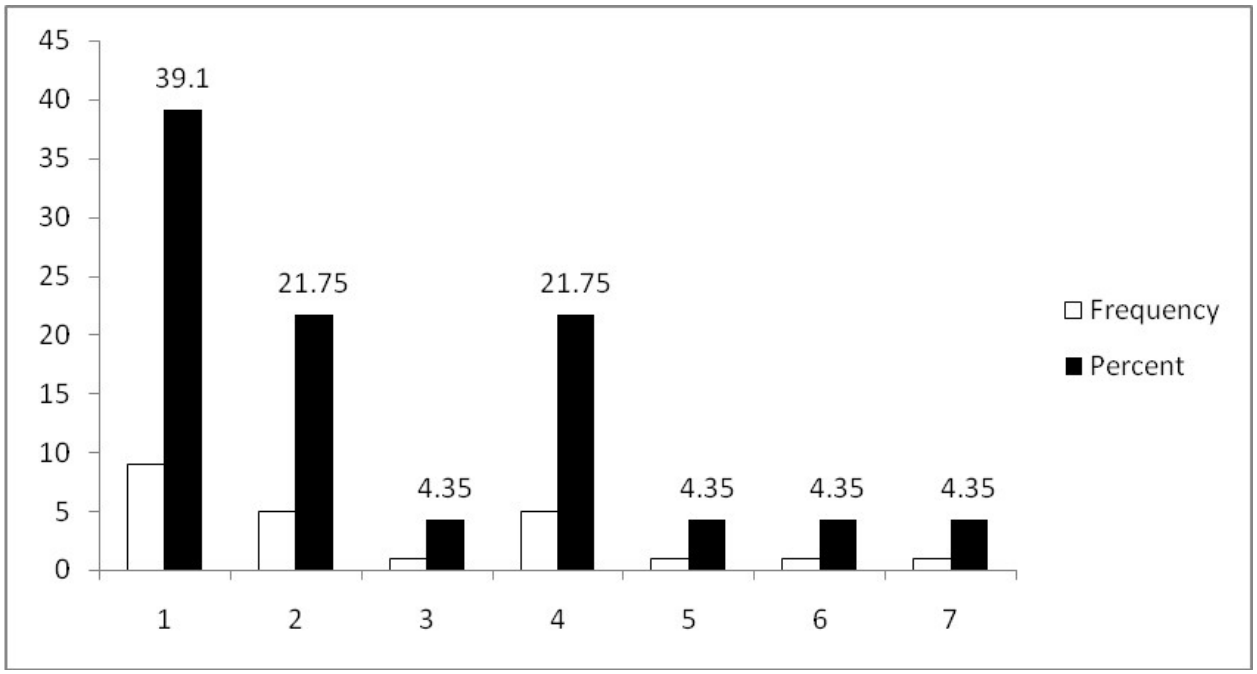

Figure 3: Types of Records Generated

1=General document; 2=Invoices; 3= Correspondence; 4=Customer Details; 5=Personnel Information; 6=Sales Figure; 7=Purchase Order

The graph in (figure 3) shows the types of records maintained by the SMMEs; and from the business process and financing perspectives, the graph represented a lack of coherent and systemic business RM. These types of records show accumulation of documents, which do not automatically translate to systematic management of business recorded information. It may represent inability of the SMMEs or incapability to provide needed information to support the business. The above might not be a justifiable evidence for regulated financial institutions granting business loans when SMMEs financial records are needed by the banks to appraise credit worthiness. It is, perhaps, because financial business transactions are evidential records often embedded in the invoices, purchase orders, and sales records which are useful to monitor market and prices fluctuation, and the SMMEs barely maintained sales records. Yet, one of the crucial selling points for SMMEs performance monitoring and evaluation is the sales figures. The findings reveal that only 4.35% maintained sales figures and purchase orders, and this alone does not depict good RM practices.

Every business requires, at least, invoices, purchase orders, and sales records to ensure accountability. These records are vital for financial institution business appraisal. These business records are essential for sales prediction, market forecast, and inventory control. This lack of financial or sales records might have explained some of the reasons why banks refused to grant loans to the small businesses, as reported by Van der Vart and Fatoki (2011) that 75% of these small-scale businesses applications to financial institutions were rejected. The lack of SMMEs managers to utilise RM for inventory control and business forecasting may be responsible for the most abrupt closure often witnessed in South Africa. This abrupt closure had placed SMEs failure rate in South Africa to be ranking among the highest in the world as reported by Bauer (2012). Business RM is vital in measuring business weekly and monthly growth trajectories, as well as quarterly and annual business performances. Maintaining these records afford SMMEs the opportunity to derive business yearly planning scorecard from this recorded information. It might be difficult to determine whether the business owners are spending business capital or profit without written cash flow evidences, financial records, and business RM that is presenting money flow which is essential for operational sustainability.

SMMEs Records Management Practices

Classification of Records

Records management compliance is vital for business operations, and it is noteworthy to know the distinct types of records maintained by the small businesses. The respondents were asked about how they classified the types of records they were keeping. Their responses show that there was no differentiation or classification of records, and thus, there were no records classifications practices. The business responses indicated that the SMMEs had no acceptable standard for records classification practices to aid viable business environments. However, only four respondents (17.4%) allowed the researcher to access their records categorisation. It appeared then that no records classification was implemented or under practice, and it was confirmed by four respondents that they had no technical knowhow to implement business records classifications. From what was witnessed and observed during the interviews, it appeared that invoices and receipts were mixed in some cases. It was, therefore, difficult to identify payment slips, invoices and purchases receipts as they were lumped together. Three (13.45%) out of the total respondents said they classified their records as sales books. Five (21.75%) of the interviewees categorised their sales, purchases and invoice records as receipts while two respondents identified having a stock book and inventory.

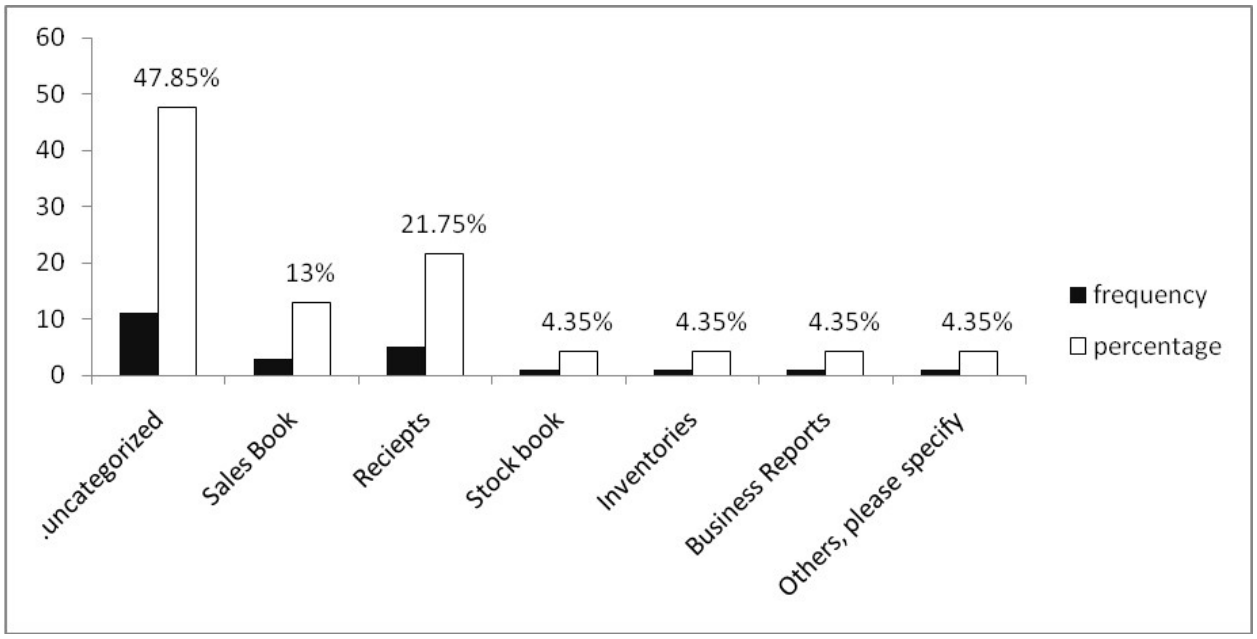

Figure 4: SMMEs Records Classification

However, records classification can promote easy identification of distinct types of records generated by the SMMEs, and classification is helpful when used in the arrangement and description of business records based on different business activities that created it. Usually, the records are arranged in a consistent and systematic way suitable to the originating provenance or company (Saul and Klett, 2008; Robinson, 1997), and it is necessary to create an automated process of appraising routine business transactional records (Saul and Klett, 2008). Twenty-two (95.7%) of the respondents indicated their incapacity to separate their records according to business utility and transactions. Perhaps the SMMEs did not see any reason why their business records should be classified. It could be as a result of lack of required knowledge to initiate or implement records classifications as indicated by five (21.75%) respondents who indicated they lacked records classification capabilities.

However, while it appears that the SMMEs lacked the required skills to implement RM, when they were asked if they thought classification could help them make better decisions, 95.7% of the

respondents agreed that classification might improve their sales records' traceability and better business decision making. Consequently, the danger is when records are not classified, it may hinder easy access to the records which may lead to a risk of inefficiency, due to inability to trace vital business records. The question on business records classification was useful in exploring SMMEs perception on the importance of separation of invoices from receipts, sales books from stock books, purchasing order from inventories and business reports from general correspondence. The ability to identify these various business records will enable companies to make informed decisions on their transactional activities.

SMMEs in Africa need to remain competitive in this volatile economic terrain. It was reported that most of the SMMEs in advanced economies utilise RM scheduling and procedures for diverse types of business records produced. They had a system for disseminating records, such as the procedure for retrieving records, and procedure for records security. SMMEs in this advanced market have adopted established procedures for creating and maintaining, storing and disposing of records (Webster, Hare and McLeod, 1999). The findings by Borglund et al. (2009) revealed that SMMEs in Europe are mostly acquainted with the significant contributions of records to business success. These findings were contrary to the SMMEs RM practices in South Africa. However, there was a business owner who indicated that she did *separate her business finances from personal expenses without which sales records management could not be adequately achieved*. She reported as presented below that she engaged an expert service in assisting with e-filing and filing for claims refunds although for taxation purposes.

> *I hire a bookkeeper who helps me to manage the financial records and who helps me with an application from South Africa Revenue Services (SARS). The respondent said she get substantial refunds instead of paying more money to the tax authority.*

However, another business owner reiterated that: *We need to keep monitoring business performance because the rent we pay on the shop is expensive, the financial records we maintain is the only way to monitor performances of each monthly sale.*

It was observed that one of the biggest challenges facing SMMEs was how to maintain cash flow and keep proper records of the money movement in and out of their businesses. The inability of the SMMEs to keep an established cash book and its management could only be translated to mean an absence of financial records management as previously indicated. The respondents were also asked if they thought that RM was important to their businesses. Twenty-one respondents said yes, but one respondent said he did know, and the other one did not give any opinion. Subsequently, the respondents were requested to rate, based on their perception of the importance of RM and records infrastructure by indicating; low, moderate, very high, and not aware, but the result included those that were undecided. Ten respondents (43.4%) rated the business RM importance very high. (see figure 5). The respondents were asked if they thought that RM infrastructure was essential. Seven (30.4%) respondents indicated that RM was essential for their efficient business management. One of the interviewees said it was important, "*because it enables me to do things differently with expertise*" and another respondent said:

> *It contributes to our business performances and we can look at what we have done by this time last year when you look at the sales book and calculate, how much we made in the month of June of last year, and June this year and we compare how much we make in July and July this year to see how we are doing.*

In contrast, four of the interviewees (17.4%) indicated that they were not aware of the importance of RM infrastructure to businesses. This may be because these respondents were not maintaining business RM. Thus, they were not trained and there were no RM experts, and the SMMEs had no formal training in records management. Hence, they may

not be aware of the needed infrastructure to maintain business records. However, lack of RM infrastructure may, in a way, unavoidably hinder their business sustainability if these companies fail to realise the importance of corporate RM, whereas Ngulube (2011) reiterated that firms that do not ascribe importance to RM activities might suffer low return on investments (ROI). The data in (Figure 5) shows the respondents' opinions on RM infrastructure importance.

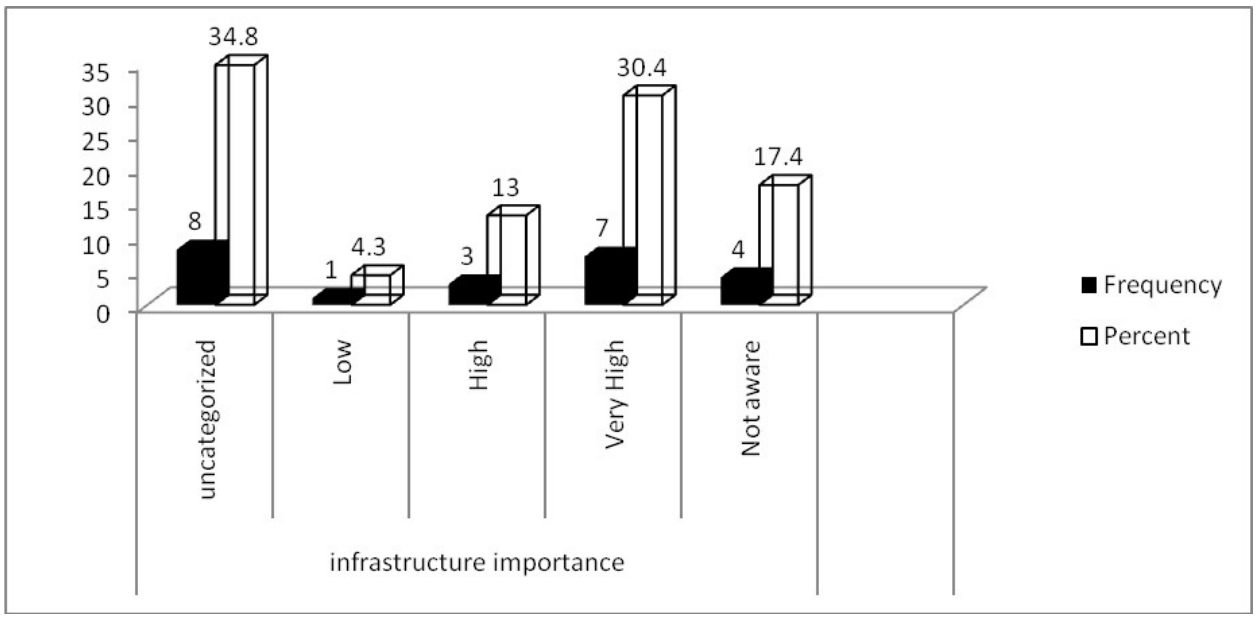

Figure 5: RM Infrastructure Importance

Records Infrastructure

There are two predominant types of records infrastructure: physical and intellectual. The physical infrastructure could be the underlying physical, organisational structure that aids systematic and logical processes of business RM such as record management policy and needed personnel for the operationalising business RM. The intellectual infrastructure may include but not limited to classification, appraisal and disposal scheduling, file plan, and required skills and training for active RM. The respondents were asked about the infrastructure available in their businesses to manage business records. None of the interviewees had either the required training or skill to support business RM. Yet it was documented that "effectiveness and efficiency of any enterprise hinge on the quality of skill used or adopted" (Kang'ethe and Ajibade, 2016:223). They were further asked if they thought it was important to have training in RM? Below were some of the excerpts from the respondents.

> *It is important; because we have lay-by and we use the records to monitor that lay-by progression (how much have been paid, what is left to be settled, we are only using our idea to write what is happening, if we can learn other better ways through training it will be better.*

It was discovered that no business infrastructure was available to manage their transactional records. The respondents were asked if they knew what is RM policy? Unfortunately, not one of the respondents indicated that they knew what RM policy is, and all the respondents affirmed that they were not aware of any legislative requirements enforcing such RM guidelines.

Consequently, critiquing the available information on SMMEs records classification and their understanding of the RM importance as indicated in (Figures 3, 4 and 5) show "below-standard" RM requirements needed for successful business operations. It was apparent that no business

records classification existed; however, the SMMEs recognition of the importance of RM was below average but very encouraging. This recognition of the RM importance substantiated that, although most of the SMMEs owners did not maintain business records, yet, they were aware of the value embedded in the business RM practices. However, only one of the respondents had a stock book and inventory records. The finding established that human resources to facilitate SMMEs RM were severely lacking. This lack of RM skill was consistent with the results of Okello-Obura (2012) in Uganda which stated that these small businesses lacked required training in RM which is needed to run a business. Unfortunately, regarding skills to effect RM, none of the SMMEs owners neither had the training nor was any of the staff members able to provide needed technical expertise required to manage business records. However, there was an exception however of one respondent who had employed external auditor for tax settlement and claim filings, and this served as part of her record filing practices.

Regarding business sustainability, it has been argued based on the premise that RM fosters return on investment (Ngulube 2011; Makhura 2005) which is critical for performance appraisal and business sustainability trajectories. The significance of RM can be measured as cost benefits over a period, as RM might save business expenses, by reducing operating spending due to continuous ability to monitor transactions information that were recorded. However, without prior business RM classification and organisational infrastructure**,** cost allocation and returns or (ROI) factors might be arduous to determine**.** SMMEs might find it hard also to support improved decision making, and to maintain evidence of transparency and accountability with their lack of RM policy in this global business milieu. However, when RM importance is taken seriously, SMMEs owners might setup RM both physical and intellectual infrastructure that is suitable for their transactions and activities. Thus, RM practices and infrastrucure may contribute to business efficiency, promote access to business information, ensure legislative compliances, and ultimately preserve market memory that is useful for risks management.

Conclusion and Recommendations

The study objectives covered the education and RM skills of the SMMEs operators, assessment of the types of records created and maintained, the SMMEs RM practices, records management infrastructure, and examining their opinions on the importance of business RM. Irrefutably, the study identified that the educational background had no direct influence on the SMMEs ability to maintain business records. The RM skills of the respondents and the knowledge or records management practices were below standard. The study confirmed that the respondents had no RM training, and did not have a system in place to enhance their records management practices. The lack of training in business RM had resulted in the lack of RM classification, which had prevented the owners from creating and monitoring sales, purchases and inventories RM. The types of records maintained by the SMMEs were sales records, invoices and purchases. The study established that there was a lack of records management practice, which might have reduced their ability to increase their return on investments and ability to monitor business performances. However, the SMMEs established that RM is relevant to their business, and the findings also established that the SMMEs acknowledged the importance of RM in improving their business operations.

There were misconceptions within the SMMEs as to what represents a document, records and what it means to be managing records. The study established that most SMMEs recognised the importance of RM to their business sustainability, but lacked the knowledge to create, manage and maintain business RM**.** Business RM often documents cash flows and credit records which may be used as an indicator of credit worthiness that banks could rely upon to grant SMMEs needed cash injection when applying for loans. Yet, the SMMEs still lacked the implementation of RM to facilitate their financial and accounting RM.

The SMMEs identified that RM is critical to their business sustainability, but expressed the lack of the knowledge and skills to implement records management practices. The study recommends that the training of SMMEs in RM should highlight the importance of records classification and help them

distinguish between physical and intellectual records management infrastructures. The study also recommends the need for the SMMEs to ensure and improve RM practices to enable monitoring of business performances and agile documentation of cash flow. The government may assist through Small Enterprise Development Agency (SEDA) to include RM training for small businesses, and designing and implementation of the RM system suitable for SMMEs heterogeneity. It is envisaged for future studies that the service-oriented design may be adopted/considered to facilitate RM system for SMMEs as it has the potential to improve SMMEs RM practices, especially enabling e-records business agility.

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Using Project Management Strategy to Evaluate the Challenges of Managing a Renovation Project at the Chancellor College Library, University of Malawi

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Abstract

This paper is based on a study which analysed the use of the project management methodology, Project Management Body of Knowledge (PMBOK) to manage the University of Malawi, Chancellor College Library floor covering renovation project in various stages from initiation through to closing. A case study approach was used in this study, with data collected through observation, focus group discussions, in-depth interviews and document analysis. The data was analysed qualitatively using thematic content analysis, and quantitative data was analysed using statistical analysis. The study findings reveal that the project management methodologies were not properly used; and where they were used, they were used unconsciously, which led to a number of challenges through the projects lifecycle in terms of the nine knowledge areas. Recommendations on the best practices of managing a renovation project using a standardised methodology were made to improve future planning of projects of a similar kind.

Keywords: Project Management, Library Projects, Library Renovations, Floor Coverings, Malawi, University of Malawi.

Introduction

Moving a small library to a new library, or in times of renovations, has been regarded as an exercise that does not involve much planning and organising or even need for research. As a result, Swanepoel (2002) observes that such views lead to bottlenecks, uncoordinated activities, delays and mistakes. But the recent rapid proliferation of complex library services such as virtual reference and digital repositories suggests that the role of librarians is becoming increasingly project-oriented (Kinkus, 2007). Therefore, work in libraries today often involves coordinating projects with numerous tasks and engaging various levels of people assigned to complete the projects within a specified time limit and often under very challenging budget constraints (Massis, 2010).

While organisations in both the public and the private sector have embraced formal project management (PM) methodologies such as those espoused by the Project Management Institute (PMI), there is little evidence that libraries are using formal or standardised approaches (Howarth, 2012). Kinkus (2007) explains that it is unclear whether current library science literature and education adequately address project management skills or other traditionally "extra-librarian" leadership qualities now needed to effectively manage project based initiatives in libraries. Stewart-Mailhoit (2015) indicates that a quick scan of any article on project management in libraries shows one of the two things (and usually both) mentioned: the lack of literature on the topic and the lack of training in PM among librarians. Burich et al. in Stewart-Mailhiot (2015) note that when project management techniques are used in American libraries, most often they are used informally, often without managers being conscious of their use.

In the past years, the University of Malawi libraries have been involved in a number of projects such as automation of the library (Wella, 2011; Eneya, 2008) which led to the introduction of Online Public Access Catalogue (OPAC), online cataloguing and circulation of dissertations and theses and establishment of institutional repositories (Mapulanga, 2014). However, the environment in which these projects were conducted were constrained financially (Nampeya, 2009; Chaputula, 2011; Chiweza, 2000; Kachoka and Hoskins, 2009) and most of the projects were successful as a result of donor funding for example, the automation project was sponsored by Rockefeller Foundation in 1992 (Wella, 2011; Eneya, 2008). In the course of the year 2015, the University of Malawi, Chancellor College Management after receiving subvention from the government decided to rehabilitate the library building as a project. The manner in which the project of replacing the carpet with a linoleum (marmoleum) floor covering was conducted is what prompted the study to establish the challenges that such a project experienced in terms of the Project Management Body of Knowledge's (PMBOK), project management methodology knowledge areas.

The main purpose of the study was to establish the challenges encountered when managing a floor covering renovation project at the University of Malawi, Chancellor College Library. The research answered the following research questions:

1. Whether the library management applied a standard project management approach, PMBOK when managing a floor covering project?
2. What were the challenges that affected the project in the terms of the PMBOK, project management nine knowledge areas?

Literature Review

The literature review focuses on project management, floor coverings and related studies on project management in libraries and challenges of managing renovation projects in libraries.

Project Management

Project Management Institute (1996) describes a project as a temporary endevour undertaken to create a unique product or service. Organisations performing projects will usually divide each project into several project phases to provide better management and control. Collectively the project phases are called the project life cycle. Cervone in Green (2010) and PMI (1996) summarises them into five categories: initiating, planning, executing, controlling and closing. The project life cycle generally defines what technical work should be done in each phase and who should be involved in each phase. Project life cycle descriptions may be general or detailed. Highly detailed descriptions which may have numerous charts, forms and checklist to provide structure and consistency are often called project management methodologies (PMI, 1996). Thus, project management as described by Project Management Institute's (PMI) and the Project Management Body of Knowledge (PMBOK) is the application of knowledge skills, tools and techniques to project activities in order to meet stakeholder's needs and expectations from a project (Burke, 2003; Kinkus, 2007; PMI, 1996). Massis (2010) points out that it is critical that all projects have a defined start, a work-breakdown structure (a grid designed to capture all the work of the project in an organised way) throughout the process, and a conclusion. If these three essential components cannot be identified, then the work was probably misdiagnosed as a project at the onset.

Project Management Knowledge areas describe project management knowledge and practice in terms of its component processes (PMI, 1996). The PMBOK describes project management under the following nine knowledge areas: project integration, project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management and project procurement management (Burke, 2003; Kinkus, 2007). Burke (2003) explains that the body of knowledge can be divided into core elements which determine the deliverable objectives of the project, namely: scope, time, cost and quality; and into the means of achieving the deliverable objectives, namely: integration, human resources, communication, risk and procurement. According to PMBOK (2008), project integration management describes the processes required to ensure that the various elements of the project are

properly coordinated, and it consists of project plan development, project plan execution and overall change control. Project scope management describes the processes required to ensure that the project includes all the work required, and only the work required, to complete the job successfully. Project time management includes the process required to ensure timely performance of the project, and cost management includes the process required to ensure that the project is completed within the approved budget (Burke, 2003; PMI, 2008). Kinkus (2007) discusses that human resource management reflects the project manager's ability to identify and acquire needed staff and to develop a productive team. Communications management refers not only to the project manager's competence in sharing information and feedback with the project team, but also in reporting progress and performance issues to key stakeholders. Procurement management, which is the ability to identify, solicit, and hire subcontractors for specific project segments, and quality management, which entails plan-ning the standards of implementation and stakeholder satisfaction that must be achieved, comprise the most visible parts of project realisation.

Most authors have concluded that the use of project management techniques within higher education libraries is not only beneficial but also necessary (Howarth, 2012). Some of the benefits include: well-planned and resourced projects, clearly defined and realistic expectations, clearly defined products and resulting outcomes, well formulated business case, effective project controls, effective scope, time, cost and quality management, integrated risk and issue management, benefits clearly linked to project outcomes, and robust information for decision making at all levels (Massis, 2010; Howarth, 2012).

The impact of carpeting in home environments on health and safety is an active area of scientific research. Some aspects of carpets can benefit the health and safety of occupants, while other aspects can contribute to illness and injury (Jacobs et al. 2008). Steinhagen and Kay (2000) suggest that the most important consideration for new floor covering in the library is to have a healthy and attractive environment with good air quality conducive to good staff morale and user comfort.

Howarth (2012) took a first step to understand how libraries were managing their projects and to uncover their activities, tools and techniques, best practices, challenges, success criteria and success factors of projects taken in the library, especially in Ontario. The results of the survey and interviews showed that the respondents had not overwhelmingly embraced a formal approach to project management. Instead, approaches tended to be informal or ad hoc, with only a few libraries employing mature strategies with formal approaches such as consistent use of templates and forms and a project management infrastructure that supported monitoring and controlling throughout the project life cycle. The results largely indicated that where project planning did occur, it happened on an informal basis; for example, communication channels that could have been established, but a communication plan was not documented, and while a project could be monitored in some fashion, regular status reports were not distributed.

Winston and Hoffman (2005) emphasised on the importance of educational preparation and training in the principles and techniques of project management for those who have responsibilities on project management in organisations. In their research, they indicated the need for a more enhanced focus on project management in degree programmes and in professional development. Further, they highlighted the importance of project management in libraries and the extent to which graduate programmes in library and information science should provide such preparation. The results reflected the overall focus on the importance of management principles, including the coverage of specialised aspects of management, such as human resources and financial management, and the limited focus on project management in library and information science programmes. The aspects of project management, which were addressed in the curricula, were discussed as the need for project management expertise for large-and small-scale projects in libraries.

Massis (2010) highlighted that communication is a main challenge of project management methodology. He noted that project management methodology operates most successfully if all of the components were learned, understood and utilised properly and strategically, especially the

communications piece. He cited reasons for the failure of a project as a lack of communication and explained that proper management of the communications component throughout the lifecycle of each project is essential to project management's ultimate success. He further pointed out that communication not only keeps everyone up-to-date on the project progress, but also facilitates buy-in and ownership of major project decisions and milestones. To ensure the success of a project, much information, including expectations, goals, needs, resources, status reports, budgets and purchase requests, needs to be communicated on a regular basis to all the major stakeholders.

In a research study done by Kinkus (2007), she conducted a content analysis of several years of library job advertisements and compared the numbers of times project management skills were included as required. The study found that the number of job advertisements explicitly requiring project management skills increased greatly between 1993 and 2003, from 4.1% to 11.2%; and in 2004, it dropped again. The study concluded that as the technological aspect of most librarian jobs continues to grow, and technology-based projects in libraries can no longer be performed by an individual or a few staff members in one department, and implementation of technology-based projects requires expertise from across the library. The study further recommended that librarians in training may find that their Master in Library Science or Master in Library and Information Science curriculum offers a course, and possibly courses, in project management; and if project management courses are not offered by their home department, interested students could seek out project management training by cross-registering with other departments.

Yeh and Walter (2016) identified the most salient critical success factors (CSF) for implementation success for integrated library systems (ILSs) migration success through a qualitative study with four cases. The study found that careful selection process, top management involvement, vendor support, project team competence, staff user involvement, interdepartmental communication, data analysis and conversion, project management and project tracking, staff user education and training, and managing staff user emotions were the most salient CSFs that determine the success of a migration project.

Steinhagen and Kay (2000) advised that the library administration should nominate a floor covering design task force to work with vendors, the administration and with the campus plant operations on the actual types of floor coverings, areas to be refurbished, timing of work, pattern and colour coordination; library administration to approve the use of different types of floor coverings for different areas of the building and consult with staff on their preferences in work areas and offices and replacement of the present flooring material to be done gradually. On moving the library, Swanepoel (2002) emphasised on the ways to calculate shelf space, mark and prepare shelves, pack, unpack and reshelve books and periodicals, and pointed out on the need for timely planning and the role of planning committee. Further, Lindsay (2007) highlighted the need to deploy office movers who were prepared to move a library collection by chronological, alphabetical, or classification order, failing which they need to be supervised.

Although renovations could not be done without challenges, the best results occurred when library planners and other participants demonstrated respect for each other's perspectives and priorities and thus were able to negotiate compromises as observed by Somerville (1988 in Lam 2006) and when library staff work with a supportive administration, a generous budget, and architects who listened to them and understood their needs (Lindsay 2007). Mix (2012) rightly observed that in times of disaster and renovations, stress can be a challenge which may lead to resistance to change. Some strategies to relieve stress during disaster and renovation include time-outs or enforced breaks, treats, recognitions, and praise. The more staff know, the less likely they are to fear the unknown. Lam (2006) suggested that librarians need to maintain patience and calmness, which are panaceas for the frustrations commonly encountered in any renovation project.

In a study by Gust and Haka (2006) at Michigan State University, USA, a number of aspects of renovations were done which included relocating the reference section, adding a cafe, adding new carpeting and furnishings, expanding library hours, providing alternatives for coming to the library, and greatly increasing computer technology. In the study,

the actions taken by the library increased users' usage of the library's physical location, increased user activity and numbers in the main library and made it a more welcoming environment.

In a study on renovation of the Li Ping Medical Library of the Chinese University of Hong Kong, Lam (2006) established the following challenges the project encountered: funding constraints, space limitations, abbreviated planning time, stakeholder agreements, structural problems of an old building with dated infrastructure and construction restrictions of a hospital environment. The renovation project took six months to complete and the library remained open throughout much of the construction.

Research Methodology

The study was carried out at the University of Malawi, Chancellor College Library. The study adopted both qualitative and quantitative approaches and used a case study methodological approach. The study population was a group of 173 workers comprising of 65 (37.6%) library staff, 12 (6.9%) outsourced library cleaners and 96 (55.5%) hired casual labourers. A sample population of 21 (12.14%) respondents was reached through both data saturation and purposive sampling. Of the 21 research participants sampled, seven (33.3%) were library assistants (team leaders), six (28.6%) were hired casual labourers, five (23.8%) were ordinary library assistants, two (9.5%) were assistant librarians and one (4.8%) was the College Librarian (See Table 1). In terms of gender, there were 17 (80.95%) male, and 4 (19.05%) females.

The data was collected using participant observation, in-depth interviews, focus group discussions and document analysis. Scheduled and unscheduled observations were done on the staff, the library and rooms where items were taken to during the project. Focus groups discussions were conducted with selected library staff, hired casual labourers and the team leaders. In-depth interviews were done on selected librarians who were involved in the project. The project files were studied to view the dates of letters written to Procurement Department and the delivery notes of the items procured and the extra hours that the staff worked on the project. The study took place between 6th December 2015 and 27th April 2016.

Table 1: Categories of sampled population of study

Category of staff	Number of respondents	Percent
Library Assistant (Team Leaders)	7	33.3
Hired Casual Labourers	6	28.6
Library Assistant (Ordinary staff)	5	23.8
Assistant Librarians (Senior Library Staff)	2	9.5
College Librarian (Senior Library Staff)	1	4.8
Total	**21**	**100**

A semi-structured interview schedule which was divided into parts according to the PMBOK knowledge areas was used to solicit answers from all the respondents. The project notes, the delivery notes and the staff registers were analysed statistically in order to know the factors that affected the implementation time and have a better analysis of availability of labour force. Thematic analysis was used to analyse data which was obtained from the focus group discussions, observations and in-depth interviews to interpret the challenges that were encountered through initiating to closing phases of the floor covering renovation project. Issues that emerged were categorised into the nine knowledge areas of PMBOK which determine the deliverable objectives of a project and the means of achieving the deliverable objectives.

Findings and Discussion of the Study

This section presents the major findings and discussion of the study.

Demographics of the Population

Out of the 21 participants who were involved in the focus group discussions and the interviews, only four (19%) were females. The age range of those who participated in the interviews was 25 to 60, with most in their thirties. All three (14.3%) senior members of staff were holders of Master's degrees in library studies, nine (42.9 %) were library assistants with Certificates in Library Studies; three (14.3%) were hired casual labourers with Malawi School Certificate of Education (MSCE); three (14.3%) hired casual labourers were holders of Junior Certificate of Education; two (9.5%) library assistants who were also team leaders of working groups were holders of Diploma in Library Science; and one (4.8%) library assistant who was also a team leader was a holder of a degree in Library Science. All the library members of staff who were involved in the study had worked with the library for not less than three years.

The study results reveal the following stages of the project:

Use of Standardised Project Management Methodology

The study found that the project did not use the PMBOK, project management methodology or any standardised project management methodology to conduct the project. Similarly, the five phases of the project lifecycle as described by PMI (1996), namely: initiation, planning, executing, controlling and closing were not consciously followed. The results concur with the observations by Howarth (2012) that the respondents of the survey had not overwhelmingly embraced formal approach to project management methodologies.

Challenges of the Project in Terms of PMBOK

The study reveals that the speed at which the project began led to some critical issues being ignored. The results indicate that all the areas of integration – planning, execution and controlling of the project were a challenge. The project plan and performance reports which are the essential inputs to overall change control (PMI, 2008; Howarth, 2012) were not available. Instead, a work plan which is just one of the ten components of the project plan, according to Dingle (1997) was developed after the project was already initiated. However, the results show that the work plan was drawn by the library management that had no knowledge of the terms of reference between the College and the contractor as recommended by Steinhagen and Kay (2000) who advise that library administration should work with administration and vendors during the whole process of planning through to implementation of a library renovation project.

On a positive note, on the other hand, status review meetings were held regularly with the members of staff of the library. The lack of essential documentation such as the project plan could be attributed to what Dingle (1997) described as weak project leadership at college management level, as well as library level and lack of project management skills by both librarians and college management as indicated by (Stewart-Mailhoit (2015) and Kinkus (2007). Dingle (1997) subsists that good project procedures supported by a good administrative system will not compensate for weak project leadership. Communication skills should be promoted by management and the project manager should ensure that everyone is aware of the need to give attention to: correspondence, reports and management meetings.

Project Scope Management

The study reveals that the staff was not clear on who the project manager was, as reported by the College Librarian. In addition, the line of authority was not clear; and almost all the members of staff from the college management and other academic and nonacademic members of staff whose role was not clear were coming to the library to issue instructions at any time which led to conflicts between college management and library management. The project manager may influence the success of the project by creating an environment where stakeholders are encouraged to contribute their skills and knowledge (Burke, 2003) and

promoting good communication (Dingle, 1997). The results are contrary to the guidelines of PMI (2008) which recommends that a project manager should be assigned prior to the project plan execution. Further, there was a simple work breakdown structure which was done by library management using basic management skills rather than any standardised project management methodology. The results are in tandem with what Howarth (2012) found that the project management approaches tended to be informal or ad hoc with only a few libraries employing mature strategies with formal approaches such as consistent use of templates and forms and a project management infrastructure that supported monitoring and controlling throughout the project lifecycle.

Project Time Management

The funding of the project came at the time when the college management did not anticipate it, as the results showed. The project started almost one month after the semester break, at the time when most library staff were on holidays and some were to start their holidays. The work took three months to complete contrary to the planned six weeks, thereby disrupting the school calendar and triggering unrest among some students who threatened to go on strike on 2nd March 2016 due to lack of access to the Library's general collection. When all the twenty-one research participants were asked about the time frame of the project they said that it did not run within the planned time. The study participants expressed resentments with the whole planning process as expressed by one of the members who said: "*The College could have planned to start the project soon after the closure of academic year on 9th October 2015 rather than starting on 6th December 2015.*" The actual period that the project took is in line with the results of the study done by Lam (2006) where the work was done for six months and time was one of the challenges for the project. The delay could be attributed to the fact that linoleum is labour intensive to install (Jacob et al. 2008), and the process of applying sealer to ensure proper bondage takes some time (Steinhagen and Kay, 2000). Besides, marmoleum was ordered from Holland which is very far from Malawi. The results show the need for realistic planning time of at least six months rather than the planned two months. Further, Howarth (2012) indicates that one of the success factors of the project is the completion of projects in time according to the schedule determined at the project outset.

Project Human Resource Management

The findings reveal problems with a number of human resource management issues. The absence of staffing management plan as recommended by PMI (1996) which describes when and how human resource would be bought onto and taken off the project plan could be observed by the researcher. The respondents during a focus group discussion indicated that the administration took time to respond to the urgent need of working overtime by the library staff (65) and providing lunch and supper for all the staff (173) who were working on the project. In addition, the results indicate that when conducting roll calls some members could sneak out and not everyone participated in the work during overtime hours (Figure 1); the administration took two months to pay its staff the overtime allowances when the job was completed; the terms and conditions of service for the hired casual labourers were not clearly spelt out regarding welfare and safety issues such as meals and in cases of injury on duty respectively; and due to lack of clarification on the vote from which the meal items were to come from and some logistical problems in the signing of the cash imprest, the food items were not always available, especially for the casual labourers.

Further, the results indicate the lack of strategies to relieve stress by administration thereby creating lack of motivation on the part of staff which slowed the whole project. The senior members of staff were supportive throughout the project and worked tirelessly to motivate the junior staff through meetings. Library management relieved the stress of the members of staff by clarifying most issues related to the project.

The study findings are in line with the study by Olney, Backus and Klein (2010) where the project coordinators demonstrated deep commitment to the project at times, keeping the site running under very difficult circumstances and through the employment of temporary workers to assist with the project.

Project Procurement Management

In line with the guidelines by PMI (1996) the library

developed a list of items to be procured as part of the procurement planning, although this was done without following any project management methodological approach. However, due to time constraint as discussed earlier the project experienced a lot of challenges in terms of procurement as the study revealed. The study also found that working materials were not purchased and delivered on time which led the work coming to a halt on a number of times as expressed by the members of the focus groups and observations made from the delivery notes. At times, due to poor communication, the procurement office could order incorrect materials and stationery which had to be returned, or the order was cancelled. The researcher also established that apart from inadequate time, procurement procedures and inadequate funding were the major reasons for the delays in the procurement of the working materials. Despite the bottlenecks, the researcher observed that the librarians stuck to the best practices on the moving of the library.

Project Cost Management

The study revealed that the floor covering project was one of the most expensive projects that the library executed since its establishment. The study findings indicate that the library had tough time to identify funding; and even when it was identified, it was difficult to get approval from the University's main office; the members of staff got their allowances two months after the project; the temporary staff were not paid on time; some suppliers were not yet paid at the time of writing; the school calendar was interrupted; and the demarcations which were pulled down were not replaced. In addition, the study established that the College Library incurred unplanned cost as such the need to put rubbers under the library tables and chairs and later the buying of new chairs and tables. The results are in line with the study by Green (2010) where the project was costly in terms of time, finances and human resource.

The findings indicate that the cost estimations were done by library management, especially for small items. As observed earlier, the library management did not take part in the selection of the floor covering, hence the library management was not involved in the initial budgeting of the project. The results are contrary to the findings by Howarth (2012) in the studies of project management practice where a good budget contributed to the success of the projects, and where project management methodologies were practised, librarians were involved with the management of the project from the initial stages.

Project Quality Management

The results reveal that the actual fixing of the floor material was impressive. The library management applied general management skills to ensure that quality was adhered to during the implementation of the project. The study established that the estates development office and college management assisted with regular inspections in order to ensure that quality of the final product was not compromised, citing an example where some temporary demarcations were pulled down at the last minute after the library management had insisted on keeping them for fear that they would not be replaced. Furthermore, the college management organised training on how to care and handle the marmoleum floor covering to ensure that the end product could adhere to the international standards. The results were within the scope of the PMI (2008) guidelines which recommend that attention should be given to the project quality management processes such as quality planning, quality assurance and quality control, although the attention was not given to detail.

The findings reveal that apart from the library being made aesthetically attractive (Lindsay, 2007), some issues which required attention benefitted from the project. The library also paid attention to the end product. For example, the old book collection was cleared from the library building; the whole library was painted; the rotten window frames were replaced with new window frames; the metal chairs and shelf stands were fitted with rubbers in order to protect the floor as recommended by Forbo (2004); temporary structures which were blocking proper lighting and ventilation and were made from cheap material were pulled down to bring an ambiance of beauty to the library, making it a welcoming environment and new demarcations of the library building were done thereby creating new spaces (Gust and Haka 2006). The findings of the study are in line with the recommendations by PMI (1996) which

states that quality management should address both management of the project and the product of the project.

Project Communications Management

A number of communication issues surfaced in the management of the floor renovation project as the study revealed. Although PMBOK (2008) recommends that information need of various stakeholders be analysed to develop a methodical and logical view of their information needs and sources to meet those needs, the study found that this was not the case. For example, the library was not involved with the initial selection of the floor covering material, contrary to the recommendations by Steinhagen and Kay (2000) that library administration should be the one to nominate the floor covering design, approve the use of different floor coverings for different areas of the building and consult with staff on their preferences in work areas and offices.

The results indicate that as suggested by Massis (2010) the College Management used communication, through meetings to buy-in the ownership of major project decisions and milestones as a way of covering up the gaps that were created at the onset of the project which created feelings of uncertainty with the floor material. Thereafter, the Library Management continued holding meetings at regular intervals to give updates on the progress of the project and encourage the members of staff. Further, the researcher observed that a formal training of proper care and handling of the marmoleum floor coverings as recommended by Forbo (2004) was also conducted after the management observed a shortfall in the care and handling of the floor covering. The results are in line with the recommendations made by Massis (2010) where communication to various stakeholders was used to ensure the success of a project through much information on expectations, goals, needs, resources, status reports, budgets and purchase requests and needs, although they were not done to the satisfaction of the stakeholders.

Project Risk Management

The library staff had a tough time in identifying the storage area for all library materials that according to Adcock, Varlamoff and Kremp (1998), could safeguard the library materials against man-made and natural disaster, theft and mutilation, pest and mould attack and poor storage and handling practices as the results revealed. The researcher observed that a number of places were identified to safeguard the books and library materials. The suggested rooms were cleared, secured, fumigated, and the floors provided with stands to ensure that books were not put directly on the floor in order to minimise the risk of damage. In the absence of stands, blankets or old carpets were used to overcome dampness from the floor. The study further shows that the books were kept in the computer laboratory and the basement in the same library building in order to minimise cases of theft. The books were packed in standard boxes which could be easily carried to avoid the risk of losing books to damage. The study findings are in line with the findings of Lam (2006) study where space limitation was an issue.

Conclusion and Recommendations

The study shows that renovating a library is a challenging exercise. Renovating a library is a major project and should be done with much planning and the involvement of all stakeholders. Renovation cannot be avoided as materials undergo wear and tear and technological changes, and new user demands necessitate changes which are always accompanied with the need to refurbish or redefine new spaces.

The study established, although the project was successful, it experienced financial, human resource and time constraints, and the actual management of the project was not within any standardised project management approach such as the PMBOK. The project was actually run as operations rather than a project. As a result, most of the recommendations by PMI (1996) were not followed, and where they were followed, they were done informally (Howarth, 2012). Some of the observable weaknesses in the management of the floor covering renovation project were: failure to identify a project manager; poor communication channels; lack of proper documentation such as a project plan, a communication plan, a staffing management plan, a budget plan, a procurement plan and a project report; lack of proper monitoring and quality control

mechanisms to ensure that planned targets were being met; poor risk management; poor cost estimations and cost control, and poor procurement planning. The strengths of the project were: understanding members of staff who worked tirelessly even under very difficult conditions to see to it that the project was completed and the contractor who tried to understand the environmental constraints that he was working on.

Based on the results, the study makes the following recommendations: the University of Malawi should adopt standardised project management methodology practices such as PMBOK at college management and library management levels and plan for formal project management training at college level which will benefit the members of staff who are mostly involved with projects, including the library management. The adoption of the project management methodologies such as PMBOK will benefit the library and the whole college in that it will assist in coming up with well-planned and resourced projects, clearly defined and realistic expectations, clearly defined products and resulting outcomes, effective project controls, effective scope, time, cost and quality management, integrated risk and issue management.

While the results show that the use of a standardised approach can help to improve the outcomes of the project, the study recommends that a simple standardised approach be developed for use in small libraries and where resources are limited, but needs to be able to cater for pertinent issues of project management.

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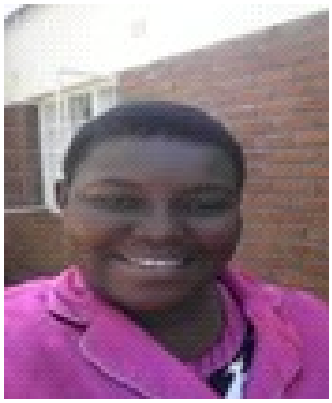

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