PRODUCTIVITY OF JOURNALS IN THE LITERATURE ON DIGITAL LIBRARIES RESEARCH ON AFRICA

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ABSTRACT

Many research described the nature and characteristics of journals in different disciplines, fields of study and subjects background. Despite this effort none was found focusing on digital library research on Africa and about Africa. Therefore this study exhibited the scholarly contributions and performance of journals on digital library research on Africa. Bibliometrics method was employed for this research. The study analysed research on digital libraries that appeared on the Library and Information Science Abstract (LISA) from 2000 – 2011. The findings revealed that 55 journals produced 240 journal articles, out of which only four of them (30.5%) were found to constitute core journals. This finding showed that, for a decade, there seem to be a very low research activity in the subject of digital libraries in Africa. The implication of these findings was that, these core journals could be considered for effective information services and for enhancement of information resources in the library environment.

Keywords: Productivity of journals, Digital library, Bibliometrics research, Scientometrics research, African scholars

Introduction

Digital libraries refer to collection of information materials emanating from different environments or geographical locations into a network, for the benefit of the users. This system enables the library to serve a very wide and diversified network of users promptly and with ease. Zhang (2006) defined, "digital libraries as information resources banks with substantive and well-designed information that can efficiently serve large numbers of people in different geographical locations with advanced technologies." Similarly, Kavulya (2007) defined digital library as, "a collection of networked digital information resources and associated technical and managerial infrastructure. In this case, digital libraries consist of e-databases, e-journals, e-books and other electronic resources." According to Shiri (2003) "Digital libraries are multifaceted and complex information structures that offer a wide range and variety of information bearing objects. They vary in their content, subject matter, cultural characteristics, language." According to Rafiq and Ameen (2009) it is a collection of resources in digital form, where

users access resources by electronic means and information is delivered to users electronically. According to Das and Dutta (2004) The Digital Library Federation (DLF) observed that:

> *Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities.*

Despite the obvious variations in the definitions of digital libraries given so far, they retain one thing in common, that is network of participating libraries. This clearly indicates that, digital libraries are better utilized when they form a network of information providers. One could also assume that, through networking among themselves, they can have opportunity to provide, offer, deliver and share information that could aid or assist in attaining their goal of enriching community of users and potential users as well with useful information and knowledge promptly. Africa as a continent must not survive in a vacuum while other continents are recording success and experiencing progressive developments on the issue of digital libraries. Damtew (2015) opined that "as the rest of the world recognises the importance of knowledge production, it has continued to intensify investment in it. But Africa, seized by multitude of social, political, economic and natural upheavals, has not yet made any meaningful commitment." However, despite this unfavourable condition of the African continent, Kavulya (2007) gave a success story on African Digital Library (ADL) research database that it consists of:

> *a collection of e books jointly created by the Association of African Union (AAU), Technicon SA (TSA) and netLibrary, an American company that specialised in setting up digital libraries for universities and companies, the objective is to develop a digital library that is available free of charge for residence of Africa for academic and business purposes, established in 1999, today ADL boasts of a collection of 8,000 book titles(p.299).*

In spite of this, some concerted efforts from countries and regions in the African continent are now put in place to see that, the continent is moving with the needs of the digital age. Nicholson (2013) advances some efforts of South Africa where repository (Wits Institutional Repository; WIRE D Space) was established. Before a digital library becomes effective in any given environment, certain elements must be considered. Ubogu (2006) cited Lang (1998) who listed out some of these elements as follows:

> a-the collection: a wide variety of materials in digital forms- books, journals,
>   manuscripts, reference works, theses and dissertations, government documents,
>   maps, video, images and pictorial materials, music scores;
> b- the provision of information about the library`s services and collections to remote
>   users;
> c- access tools: online library catalogues, subject gateways, portals;
> d- services: reference services, online tutorials, on demand publishing, electronic
>   reserve-short loan and course packs, electronic course pack, lecture notes;
> e- networking and imaging technologies to support and enhanced all aspects
>   of a library`s basic operational activities-Z39.50, repository software- Dspace
>   e-Print, etc., Open Archives Initiatives (OAI);
> f- networking and imaging technologies to facilitate closer cooperation with other
>   bodies; and
> g- expertise within the library for the application of new technologies to library
>   activities and bibliographical research of all kinds(p.7).

In the African environment today, provision of the above-mentioned elements will not be effected comprehensively and easily without some impediments. These include erratic power supply, lack of expertise, lack of awareness and poor management of the digital resources. All the cries and yearnings about digital libraries in Africa are largely centred on producing, creating and making digital information, rather than its use, sustainability and effective management. Similarly, Larsen (2003) observed that "our

ability to generate and collect digital information continues to grow faster than our means to organize, manage, and effectively use it. This trend is likely to continue without focused research and development." In the same way, ECA documents of the years (2003; 2005) emphasised on the weaknesses surrounding African libraries, which eventually prevent research in the area of digital libraries. The documents opined that:

> *Currently the majority of libraries in Africa cannot effectively play their role in the information society due to the so-called "great African library decline", which started in the early 1980s, at the on-set of structural adjustment programmes. This decline is characterised by: very poor funding; total lack of, or inadequate application of information technology; unavailability of , or unreliable access to the internet; rusty professional skills and outlook due to inadequate resources for training and development; demoralized management; dusty shelves with old and irrelevant books; and inadequate or no physical development; and absence of library activism and advocacy (p.17).*

Azuibike (2006) gave further example with the Nigerian situation that "majority of Nigerian libraries share the same conditions as the average African library."(p.105) To further buttress this, Abubakar (2010) noted that another major constraint to digital libraries in Nigeria is the existence of erratic and epileptic power supply. Nigeria is a country characterized with constant power outage; which tends to have negative effects on all developmental projects, and clearly portrays a potential danger. Digital libraries cannot survive in this kind of unfortunate condition. However, this study was conducted with the purpose of finding the extent to which research is conducted in the subject of digital library in the African environment. It will bring to the limelight the efforts put across by the African scholars on the issue of digital libraries research.

Literature Review

Digital library attained its current status as a result of technological advancement in general and the research conducted for its development in particular. Many research have been conducted and more are being conducted across the globe with a view to improve its growth and development. In this vein many aspects of digital library have been investigated which include design and development of digital library resources, management of library resources, perception of users of the library and so on and so forth. Soergel (2002) opined that "to advance digital libraries to their full potential, a broad-based library research and development framework is needed both to evaluate and integrate existing research and practice and to provide a structured vision for what digital libraries can be." This statement clearly indicates that researches on digital libraries need to be based on a solid and relevant framework. Similarly, Diso ((2011) emphasised on the necessity of producing a regional policy which could serve as a framework for effective sharing of knowledge by all and sundry. Soergl (2002) outlined eleven themes for which there is need for research.

Bryan-kinns and Blandford (2000) conducted a survey of user studies for digital libraries in which the examined the techniques and methods used in the studies surveyed and concluded that, there is need for more researches particularly, on information sources such as digital libraries, and how people may utilize it. From another dimension Dobreva and Feliciati (n.d.) remarked that, to have clear understanding of what the users require may generally attract professional discussions and solutions. This brings about the roles of information providers, librarians and similar information workers and professionals in the provision of information using the digital library approach. Their traditional ways practiced in conventional libraries must change and must adopt new roles and dimensions in meeting the information needs of people. Warwick et al (2007) established that far from being unneeded, digital libraries require librarians to take on new roles. Librarians and other information workers have therefore become providers, gate keepers and intermediaries for information accessibility and use.

In Africa, a significant number of research are centred on digital divide or digital gap that exists between the continent and the technologically advanced continents. The few ones conducted on digital

libraries in Africa could be clustered under three indicators namely, development, problems and prospects. Ojedokun (2000) identified inadequate skills to use digital resources, inadequate ICT infrastructures, lack of encouragement of access to and use of information technology, and the shortage of management and technical expertise as the major challenges facing the development of digital libraries in Africa. However as a result of series of attempt in the conduct of research on digital library in the African continent, the Greenstone software has been recommended for African countries. Consequently some adopted the software for building and distributing digital library collections. Kujenga (2010) reported that EIFL teamed up with the Koha Foundation. In 2007 to run a pilot project in Southern Africa to develop expertise and to grow the network for Greenstone and by 2009 it was extended to involve sixteen countries.

He further highlighted that lack of technical infrastructure and computer skills to customize applications copyright and preservation issues pose challenges in the development of digital libraries in Africa. Igun (2012) examined digital libraries in Africa: evolution, status and challenges where she considered a number of issues regarding digital library development in the continent. Furthermore in the aspect of researches, International Conference on African Digital Libraries and Archives (ICALDA) was formed in 2009 to serve as a forum to examine and review virtually all aspects of development of digital libraries in Africa. Significant changes could be witnessed from many corners in the continent. Abubakar (2010) asserted that, In Africa and Nigeria in particular the issue of digital libraries is still at an infancy level. While in other parts of the world the development of such libraries has reached an advanced stage. Abubakar (2010) cited Gbaje (2007) who observed that the National Universities Commission Virtual Library Project initiated in early 2002, the National Board for Colleges of Education Virtual Library, the National Open University Library Project and the UNESCO Virtual Library Pilot Project initiated in 2003 were some of the various initiatives by the Nigerian Ministry of Education regarding Virtual (Digital) libraries for higher institutions in Nigeria. Yet, none of the efforts had yielded any functional virtual (digital) library at that time.

Similarly, Abubakar (2010) clarifies further that, besides, the rapid growth of the telecommunications industry in Nigeria, another recent success story in digital library development in the country was reported by IT News Africa (2010) which stated that the Mobile Telephone Networks (MTN) Nigeria had successfully deployed and commissioned digital libraries in three (3) Universities in Nigeria. The three universities are the Ahmadu Bello University, Zaria, the University of Lagos and the University of Nigeria, Nsukka. Similarly Kavulya (2007) opined that, the main areas of focus of such initiatives are: research into digital libraries: advancing the capacity of libraries to collect, store, organise and deliver information in digital form; and providing communities with the capacity to retrieve and apply digital information. However, Diso (2011) offered that, in terms of information infrastructure, physical and virtual structures and facilities, Africa has made some modest progress, which with some resuscitation or upgrading, as the case may be, could easily be converted to serve as platforms for developing digital libraries and archives in Africa. Similarly progress could be made whenever the agenda of world summit on the information society (WSIS) about developing countries is executed.

Azuibike (2006) listed out a number of issues that centred around accessibility to information, knowledge and libraries, these issues need to be urgently addressed for attainment of success in digital library research in Africa. Such as provision of enabling environment for professional practice, effective practice of freedom of information, capacity building that could provide enough and relevant training for the professionals as well as developing relevant infrastructure. Similarly, Chowdhury (2009) highlighted on user study as an integral part of digital library research for quite some times. There are many approaches and dimensions in which research on digital libraries are focused. Despite all the developments and little progress made, the question still remain on the digital library research, are we there yet?

In the context of this research a bibliometrics approach was employed to ascertain the extent to which research is conducted on digital libraries in Africa as a continent. Glover and Bowen (2004)

commented on many ways with which bibliometrics and citation tools could be used. Bibliometric analysis could provide an avenue for conducting research using large data. Lo (2010) in his study of genetic engineering research says that "during the past several decades, plenty studies were done to show the productivities and research impact. There are quite an amount of studies which applied the methods adopted from bibliometrics while periodical articles were used for analysing"(p.110). Along this line, Chang, Wu and Leu (2010) used bibliometrics techniques to analyze the status of technical development in the field of carbon nanotube field emission display CNT-FED. The different aspects of patenting activities are compared and the goal of this preliminary analysis is to understand the developmental path and current states of CNT-FED technology." Also Gonzalez-alcaide, et al (2008) bibliometrically analysed periodicals that were listed in the LISA database on the literature of library and information sciences.

Similarly Lee, Kim and Kim (2010) conducted a bibliometrics study on the term digital library as it appeared in the LISA database. Julien, Pecosckie and Reed (2011) outlined data on information behaviour research from the LISA database and content analysed the data using bibliometrics approach. Li and Willet (2010) in their bibliometrics research on Chinese role on the disbursement of research on the literature of cyclization, MALDI-TOF and Antibiotics found that, "The productivity of the Chinese research is growing rapidly." Ritz, Adam and Laing (2010) in their study on publication pattern in access to medicine in developing countries conclude that, "Although an increasing trend in number of publications per year was found, the increase was relatively small and variable over a 10 year period." According to Wani, Hameed and Iqbal (2013) "new knowledge can be acquired only with the pursuit of research to extend the frontiers of knowledge. It plays an important role in all round development of a country, be it science and technology research or any other filed. With the advancement in the fields of science and technology, research is gaining its pace day by day"(p.107). Generally, research activity grows in line with the advancement of any given society. The extent of commitment shown by various governments on education indicates the level a given country operates in research activities.

Methodology

Library and Information Science Abstract (LISA) was considered as the database for this study. The abstract provides all the information materials needed for the research. The database is among the leading databases used for various form of researches in the field of library and information science. It contains bibliographic information on all aspects of library and information sciences. This study takes care of only journal articles because; they constitute an avenue where major findings of researches are published, shared and disseminated. The search term used to draw out relevant information for this study was **_digital libraries_** and **_Africa_**. A total of 240 journal articles were earmarked for the study. The time span for the study was 12 years; 2000-2011. Information was compiled under the following pointers; Title of journals and title of articles. A total sum of 240 journal articles was realized from 55 journals. Table, 1 on page , 9, exhibits the data on the articles published by each of the journals earmarked for the study. Core productive journals were realized by applying the Bradford`s law of scattering to the data provided in Table, 1.on page,9 and Figure, 1 on page, 11, shows Bradford`s plot for the spread of digital libraries research in Africa literature. Bradford (1948) arranged journals according to their output. " If the journals containing articles on a given subject area are arranged in decreasing order of productivity of articles they carried on the subject, then successive zones of periodicals containing the same number of articles on the subject form the simple geometric series 1: n: n2 : n3" (p.953).

Findings and Discussion

The findings indicate that, fifty-five journal titles produced two hundred and forty journal articles during the period of the study. This finding clearly shows that growth of research on digital libraries in African continent is rather very slow, considering the twelve year period of the research. Despite the fact that this research was limited to only one database, one could think that, a decade of research could reveal

hundreds or thousands of research in digital library in the continent. Another striking finding reveals that four journal titles constitute the core. This indicates that they produced journal articles more than the rest of the journal titles listed in the study. The breakdown of the four journal titles in Table 1 show that the highest number of articles per single journal title recorded was thirty-one; followed by seventeen articles produced by one single journal.

Another journal produced twelve journal articles; followed by one journal that produced ten journal articles. These four core journal titles could be relied upon by libraries and information centres in their selection and acquisition exercises. This is because the journals consistently produce or publish articles on digital libraries researches in or about Africa. Additionally, Figure 1 shows clearly that the literature on digital libraries in or about Africa was concentrated within the core journals. The core journals are four in number and can be seen on the graph conspicuously. The four core journals are as follows: 1. IASA Journal (31 articles); 2. EASABRICA Journal (17 articles); 3. Electronic Library Journal (12 articles); and 4. Innovation Journal (10 articles). In Table 2, the journals that produced two or more papers were ranked according to their contribution and productivity. The journals identified for the research are arranged in decreasing order of productivity to the literature of digital researches. Bradford`s Law of Scattering of journal articles was applied to the data of the digital library research and the result shows significant conformity with the law.

Table 1: Productivity of Journal Literature

A	B	C	A x B	D	E
31	1	1	31	31	15.9
17	1	2	17	48	24.6
12	1	3	12	60	30.7
10	1	4	10	70	35.9
9	1	5	9	79	40.5
8	3	8	24	103	52.8
7	2	16	14	117	60
6	1	17	6	123	63
5	1	18	5	128	65.6
4	2	20	8	136	69.7
3	9	29	27	163	83.5
2	16	55	32	195	100

Key

A – Number of articles

B – Number of titles

C – Cumulative number of titles

D – Cumulative number of articles

E – Cumulative number of articles per title

Table 2: Ranked Order of Journals that Produced Two or More Papers

1	IASA Journal	31
2	EASABRICA	17
3	Electronic Library	12
4	Innovation	10
5	Cape Librarian	9
6	South African journal of information management	8
7	Information Development	8
8	International Information and Library Review	8

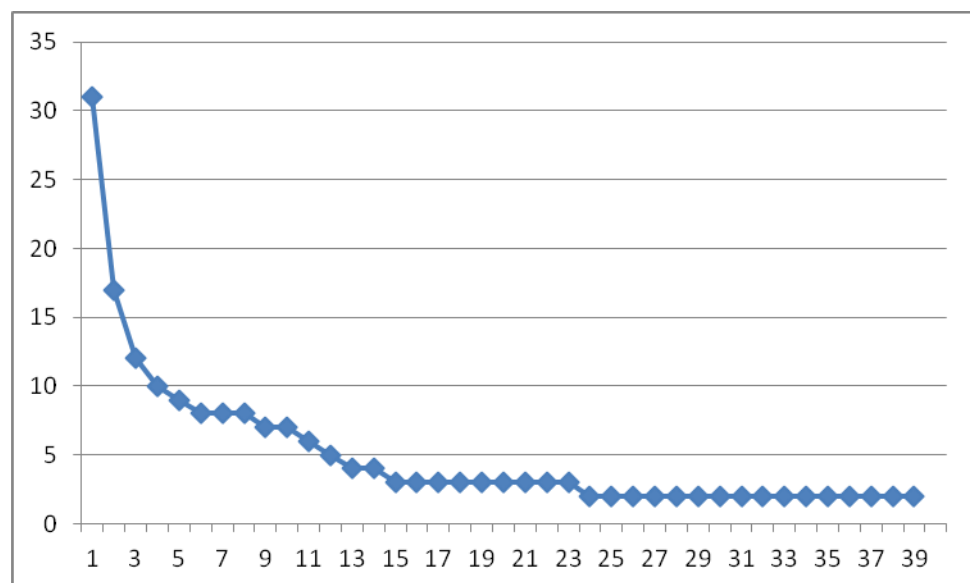| 9	African Journal of Library, Archives and Information Science	7
10	Mousaion	7
11	African Research and Documentation	6
12	South African Journal of Archives, Library and Information Science	5
13	LIBRI	4
14	First Monday	4
15	OCLC Systems and Services	3
16	Journal of Information Science	3
17	Program	3
18	IFLA Journal	3
19	International Journal of Innovation in the Digital Economy	3
20	Library Review	3
21	Library Philosophy and Practice	3
22	Information Technology for Development	3
23	Information Communication and Society	3
24	Telematics and Informatics	2
25	Government Information Quarterly	2
26	Open Learning	2
27	Telecommunications Policy	2
28	Aslib Proceedings	2
29	Online Information Review	2
30	International Journal of ICT Research Development in Africa	2
31	Malaysian Journal of Archives, Library and Information Science	2
32	LIBRES	2
33	Library High Tech	2
34	Information World Review	2
35	The Grey Journal	2
36	Journal of Documentation	2
37	Advanced Technology Librarians	2
38	Reference Services Review	2
39	International Journal of Information Management	2

Figure 1: Nature of Growth (Journal Ranks)

Conclusions and Recommendations

The study concludes that digital library research by the African scholars is not well pronounced and practiced. In another dimension, there are only few attempts to conduct research on digital library on Africa. That explains the reason why only four journals were found to constitute the core in which digital library research on Africa are published regularly and consistently. The study recommends the following:

1. Nonetheless, the implication of findings of this research clearly indicates that libraries that intend to develop information resources on digital libraries research on Africa globally and more especially libraries situated in the African continent could go for the core journals. The core journals found as a result of this research are considered to be publishing journal articles on the subject matter consistently.

2. Usage of these core journals could assist significantly in the provision of relevant information resources and materials on the issue of digital libraries researches to the researchers and other library users.

3. Additionally it could also serve as a good pointer in guiding the professional librarians in their selection and acquisition exercises.

REFERENCES

Das, A.K. & Dutta, B. (2004). An introduction to auditing and control of digital library systems. *Annals of Library Science and Documentation*, 51(3), 99-103.

Lo, S.S. (2010). Scientific linkage of science research and technology development: a case of genetic engineering research. *Scientometrics*, 82, 109-120.

Chang, P. Wu, C. & Lau, H. (2010). Using patent analyses to monitor the technological trends in an emerging field of technology: a case of carbon nanotube field Emission display. *Scientometrics*, 82(1), 5-19.

Ritz, L.S., Adam, T. & Laing, R. (2010). A Bibliometrics study of publication patterns in access to medicines research in developing countries.*Southern Medical Review*, 3(1), 2-6.

Lee, J.Y., Kim, H. & Kim, P.J. (2010). Domain analysis with text mining: Analysis of Digital library research trends using profiling methods. *Journal of Information Science,* 36(2), 144-161.

Julien, H., Pecoskie, J.L. & Reed, K. (2011). Trends in Information behavior research, 1999-2008:A content analysis. *Library and Information Science Research*, 33, 19-24. Available at, www.elsevier.com/locate/lisres

Gonzalez-Alcaide, G., Castello-Cogollos, L., Navarro-Molina, C., Aleixandre-Bennvent, R. & Valderrama-Zurian, J.C. (2008). Library and Information Science research areas: Analysis of journal articles in LISA. *Journal of the American Society for Information Science and Technology*. 59(1), 150-154.

Kavulya, J.M. (2007). Digital libraries and development in Sub-Saharan Africa: A review of challenges and strategies. *The Electronic Library*, 25(3), 299-315. http://dx.doi.org/10.1108/ 0264047071075 4814

Zhang, W. (2007). Digital library intellectual property right evaluation and method. *The Electronic Library*, 25(3), 267-273.

Shiri, A. (2003). Digital library research: Current developments and trends. *Library Review,* 52(5), 198-202

Rafiq, M. & Ameen, K. (2012). Use of digital media and demand for digitized contents in higher education sector of Pakistan. *The International Information and Library Review* doi:10.1016/j.iilr.2012.04.007

Nicholson, D. (2013). South African Digital Library.libguides.wiits.ac.za/content.php?pid= 297227&siid=2444884

Ubogu, F.N. (2006). Trend in Digital Library Services in South Africa: Library portals and ETD system. Nigerian Library Association: 44th Annual National Conference and AGM, Abuja. 1-39

Lang, B. (1998). Developing the digital library. In Leona Carpenter, Simon Shaw and Andrew Prescott (eds). Towards the digital library: The British Library's Initiative for Access Programme. London: British Library

Larsen, R. & Wactlar, H. (2003). Knowledge lost in information, report of the NSF Workshop on research directions for digital libraries. Catham M.A., June 15-17, Available at:http//www.sis.pitt.edu/-dlwkshop/report.pdf.

ECA (2003). The value of Library services in development. April (E/ECA/CODI.3/16) http://www.uneca.org/codi

ECA (2005). National knowledge systems and the status of information access policies in Africa. 26 April (E/ECA/CODI/4/50); http://www.uneca.org/codi

Azubuike, A.A. (2006). The world summit on the information society: issues and the way forward for Nigerian libraries. Nigerian Library Association: 44th Annual National Conference AGM, Abuja 95-115.

Abubarka, B.M. (2007). Resource-sharing among libraries in Nigeria. TRIM, 3(2), 105. http//www.ojs.uok.edu.i/../109/

Soergel, D. (2002). A framework for digital research: broadening the vision. *D-Lib Magazine*, 8(12).

Diso, L.I. (2011). Policies for digital libraries and archives in Africa: developing strategies for access to knowledge for development. *International Journal for Information Science and Management*, 9(2), 55-68.

Bryan-kinns, N. & Blandford, A. (2000). A survey of user studies for digital libraries. RIDL working paper.

Dobreva, M. & Feliciati, P. (nd). User studies in digital libraries: Models, Standards, Methods, Question. Retrieved 07/02/2014

Warwick, C. (2007). Library and Information resources, and users of digital resources in the humanities. Unpublished research.

Ojedokun, A.A. (2000). Prospects of digital libraries in Africa. *African Journal of Library Archives and Information Science*, 10(1), 13-22.

Kujenga, A. (2010). Building digital libraries in Africa: Local content, regional support.

Igun, S.E. (2012). Digital libraries in Africa: Evolution, status and challenges. *International Journal of Digital library systems*, 3(2), 13-17.

Gbaje, E.S. (2007). Challenges of implementing virtual library for higher institutions in Nigeria. A paper presented at the Conference of the Nigerian Library Association (NLA) 42.

Glover, S.W. & Bowen, S.L. (2004). Bibliometrics analysis of research published in tropical medicine and international health, 1996-2003. *Tropical Medicine and International Hhealth,* 9(12), 1327-1330.

Li, J. & Willet, P. (2010). Bibliometrics analysis of Chinese research on cyclization, MALDI-TOF & Antibiotics. *Journal of Chemical Information Model*, 50(1), 22-29.

Wani, Z.A., Hameed, O. & Iqbal, A. (2013). Research productivity of medicos at All India Institute of Medical Sciences (AIIMS). *International Journal of Information Dissemination and Technology*, 3(2), 107-113.

Bradford, S.C. (1948). Bradfords law and bibliography of science. *Nature*, 224, 953-56.

Teferra, D. (2015). Striving at the periphery, craving for the centre: the realm of Africa scholarly communication in the digital age. *Journal of Scholarly Publishing*, 35,3 DOI: http://dx.doi.org/10.3138/jsp.35.3.159.