



Use of Open Access Journals for Improved Research Output by Academic Librarians in Universities in North Central Nigeria

Shidi Hungwa, Ph.D.¹, Prof. Nwachukwu Victor N.² & Ode Alice Ogwo³

¹Federal University, Lokoja, Kogi State
Shidi.john@yahoo.com

²Department of Library and Information Science, University of Nigeria Nsukka

³Benue State Polytechnic, Ugbokolo, Benue State

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Abstract: The use of the journals especially open access journals is important in every academic environment for research as it affect publication output of academics including librarians. This paper examined the use of open access journals for improved research output by academic librarians in universities in North-Central Nigeria. The paper adopted ex-post facto research design and a self-constructed questionnaire was used to collect data. Population of the study was made up of 209 academic librarians in 13 (7 Federal and 6 State owned) universities in North-Central Nigeria. The data was analysed using mean and standard deviation to answer research questions while Pearson's product moment correlation coefficient was used to test the hypothesis at 0.05 level of significance. It was found that, the number of open access journals that were in high use by the librarians were slightly lower than those in low use. It was also discovered that, academic librarians derived a lot of benefits from the use of open access journals and that, research output of the academic librarians was higher in conference papers (2.22) followed by chapters in books and coauthored textbooks (2.20 each), textbooks (2.18) and lastly articles in learned journals (2.00). It was recommended among other things that, University libraries in North Central Nigeria should make a substantial subscription to relevant full text databases and release their content to public domain for use by colleagues so as to increase their use of the journals.

Keywords: Open access, research output, journals, academic librarians, North-Central Nigeria

Introduction

Part of the mandate of librarians anywhere is to assist library users to locate information materials in whatever form and location it may be found. This was the outcome of the four fold duty of librarians which include acquisition, organization, preservation and dissemination. These stages are all geared towards making information available to library users from remote locations within specific time periods.

Some of the information were before now domicile in books, journals, conference proceedings and others in print form. The advent of electronic information saw information in different formats including e-books, e-journals, CD-ROM databases and institutional databases. Journals which contain current information for research were hitherto difficult to come by as libraries found it difficult to subscribe to them on account of dwindling budget. The introduction of open access journals has however provided leverage to many researchers both in the library and university faculty. Open access means free release of electronic information to users through the internet.

Open access journals are scholarly journals that are made available online free of all charges except those pertaining to Internet access. According to Suber (2006), open access journals are scholarly journals that are available online to the readers without financial, legal, or technical barriers other than those pertaining to gaining access to the Internet itself. They are peer-reviewed journals whose articles may be accessed online by anyone without charge. In many cases they may also be published

in print (Joint Information Systems Committee (JISC), 2005). Novella (2013) asserts that, they are journals whose funding model does not charge readers or their institutions for access. Citing Directory of open access, Novella affirmed that, open access journals are those whose contents can be read, downloaded, copied, distributed, printed, searched and linked to full text of the articles. Some of the examples of open access journals in library and information science include Library Philosophy and Practice (domicile in USA), Cybarians Journal (Egypt), Libres: Library and Information Science, Research Libraries (Australia), Webology (Iran) and many others.

There are countless benefits derived by researchers, educational institutions, businesses, the public, and research funders from open access journals. The benefits range from increased visibility, readership and impact of authors' works to increased competitiveness of academic institutions and capacity to meet the criteria for the institutions' rating. Other benefits are stimulation of new ideas, new services, new products, creation of better educated populace and encouragement of greater interaction with results of funded research.

The introduction of open access journals have affected the academic world significantly both globally and locally including North Central Nigeria. Through it, great volumes of information materials have been released and made available to researchers worldwide which has enhanced research activities. Researchers have partially been relieved of cost of publishing as many open

access journals accept to publish articles without fee. Many researchers worldwide have used this opportunity to increase their research outputs.

Researchers show great willingness to use free sources of information as in the case of open access journals but have not been adequately informed of their existence in considerable number (Ivwhighrehweta & Onoriode, 2012). Such will likely depend on subscription-based journals, thus spending considerable amount for access and use. However the use of open access journals is expected to remove the bottlenecks occasioned by high cost of subscription of journals and thus provide a platform for librarians in universities in North Central Nigeria and of course other parts of Nigeria to improve their research outputs.

The number of publications contributed by academic librarians is known as research output and comprises an important criterion in measuring their successes. It refers to the number of published information materials (example books, chapters in books, journal articles, conference proceedings and technical reports) to the credit of a researcher for the dissemination of his research findings (Madu, 2009). Research output is one of the determinants of or ways of measuring productivity of academic staff of universities all over the world including Nigeria. It is a means by which academics contribute new knowledge to the existing body of knowledge in form of journal articles, technical reports, books or chapters of book (Okpe, Simisaye & Otuzo, 2013).

Print and Hattie (1997) in Okiki (2011) succinctly define research output as the totality of research works produced by academics in universities and related contents within a given period. It is a means by which academic librarians and other academics contribute their ideas to the existing body of knowledge. Research output of individuals and by extension of universities is reflected in the number and quality of articles in accredited journals, books, chapters in a book, conference proceedings. (Obibuaku, 2005; Akuegwu, Udida & Bassey, 2006; Toncich, 2008).

Academic librarians whose output is under examination are librarians working in university libraries (and probably polytechnics, Colleges of Education and other tertiary institutions). The focus here is on those in universities. They are expected to hold at least a first degree in library science, library and information science, library studies and so on as the case may be. There is a higher expectation for them in the contemporary times. According to Holley (1985, p467), “the academic librarian today must have a masters in Library Science (M.L.S.) degree which is assumed to provide him or her with the professional and technical skills he or she needs to begin the practice of academic librarianship” and to be better equipped for scholarly academic research. Holley however submitted that, this position has no universal acceptance yet. He stressed that, “that the Masters of Library Science “M.L.S. is the "terminal degree" for librarians has not achieved wide acceptance on most campuses” (p467).

According to Librarians' Registration Council of Nigeria (2014), academic librarian is a professional trained with a minimum of a first degree in Library and Information Science. In the context of this work therefore, an academic librarian is a librarian that works in university libraries who holds at least a first degree in Library and Information Science or who has a first degree in another discipline and a Masters degree in Library and Information Science. He or she is expected to be certified for practice by the Librarians' Registration Council of Nigeria.

Statement of the Problem

Publishing has the capacity of increasing research output and visibility of an individual academic. This underscores the compelling need for academic librarians to get involved in conducting research and publishing research results. Though high processing fee for journals had been a bottleneck for many authors, open access publishing is expected to bring a relief to many authors. Academic librarians that are not aware of open access journals however still face the challenge of high cost of accessing information resources with which to conduct research, high cost of publishing, low visibility and eventually delayed promotion. This lack of awareness is likely to affect even the institutions for which the academics serve. It was observed that, online visibility of journal articles from librarians in university libraries in North Central Nigeria was low compared to southern universities. Ango (2019) found that, the level of use of open access journals by academic staff in

North Central Nigeria was only fairly high. This presents a worrisome situation and poses a question as to whether academic librarians in North Central Nigeria use much of open access journals for the purpose of publishing so as to improve their research output. It is expected that, if academic librarians use open access journals which are obtained at a limited or no cost, they may be motivated to get more involved in research and increase their research outputs.

Objectives of the Study

The main purpose of the study is to investigate use of open access journals for improved research output by academic librarians in universities in North Central Nigeria. The study will address the following objectives: to

1. examine the extent of usage of open access journals by academic librarians in North Central Nigeria for research.
2. find out the benefits derived from open access journals by the academic librarians to promote their research output.
3. determine the research output of academic librarians in Universities in North Central Nigeria.

Hypothesis

Ho₁: No significant relationship exists between use of open access journals and research output of academic librarians in Universities in North Central Nigeria.

Literature Review

Open access is the provision of unrestricted access to peer reviewed scholarly journals, journal articles, and other information resources through the

Internet. Key Perspectives (2007) considered it to be free online availability of articles and other scholarly research output so that anyone can see and use them. According to SPARC (2013) open access provides free and immediate availability on the public Internet of those works which scholars give to the world without expectation of payment – permitting any user to read, download, copy, distribute, print, search or link to the full text of these articles, crawl them for indexing, pass them as data to software or use them for any other lawful purpose.

Two major ways through which open access publications can be made available to the public are: gold road (gold open access) and green road (green open access). Suber, (2013) stated that, when authors provide access to their publications by publishing them in open access journals, they are referred to as gold open access while green road refer to articles that are self archived. Harnad, *et al.* (2008) explained the two concepts thus “golden” road (publish your article in an OA journal) and the “green” road (publish your article in a non-OA journal but also self-archive it in an OA archive).

According to Bibliotheca Alexandrina (2008, p2),

In OA self-archiving (also known as the "green" road to OA), authors publish in a subscription journal, but in addition make their articles freely accessible online, usually by depositing them in either an institutional repository. In "gold" road to OA, authors publish in open access journals that make their articles freely

accessible online immediately upon publication.

Exposure to open access publications has the capacity of presenting a rich platform for publishing by academics and increasing research output. Research output in the words of Okpe, et al (2013) is one of the determinants of or ways of measuring productivity of academic staff of universities all over the world including Nigeria and a means by which academics contribute new knowledge to the existing body of knowledge in form of journal articles, technical reports, books or chapters of book. Popoola (2002) presented counting of the numbers of books published, or journal articles produced over a period as a means of measuring research output of librarians.

A study was carried out by Iwighreghweta and Onoriode (2012) on the awareness and use of open access journals by LIS students at the University of Ibadan, Nigeria. It was expected to find out the level of awareness and usage of open access journals by master's degree students, benefits derived from the use of open access journals by masters' degree students and problems militating against their use. The study employed descriptive research method using ex-post-factor type of design and covered the entire population of 144 masters degree student of the Department of Library, Archival and Information Science, University of Ibadan, Nigeria. The study disclosed that students' use of open access journals is still far from expected even though the students show great willingness to use free sources of information. It was recommended that,

stakeholders intensify efforts in the creation of awareness of existing research/study aids under which exists open access journals. Students were also to make conscious efforts to search for existence of open access journals to enrich their research citation. The authors investigated awareness and use of open access journals but without recourse to research output. Also, the study was done in Ibadan in the South West zone of Nigeria and not in the North Central zone.

Another study was undertaken by Oni and Eziam (2014) on publication output of librarians in university libraries in Edo and Delta states of Nigeria. The study was aimed at bringing to limelight the publication output of librarians in University libraries in Edo and Delta states. The population of the study consisted of academic librarians in five university libraries in Edo and Delta States. The study revealed that few librarians from Edo and Delta states have 21 and above publications. A majority of the respondents published their work mostly in journals (print and electronic). The study also revealed that librarians from Edo and Delta states agree that promotion/career advancement, contribution to knowledge and visibility/recognition are some of the major benefits derived from publication output of librarians. Long working hours/time and heavy work load, high publication charge, finance and lack of incentives are the major constraints militating against the publication output of librarians of both states. The findings of the study would be useful to the library management and the university

authorities on the need to create enabling conditions and fund for research activities. The study recommended collaborative publishing between librarians with higher degree and those with lower degree.

Adegbaye, Okorie, Wagwu and Ajiboye (2019) conducted a study on Workload as Correlate of Publication Output of Academic Librarians in Universities. The study adopted a descriptive research design taking a total enumeration of 107 academic librarians in private and government-owned universities in Ogun State. Findings from the study revealed that academic librarians' publication output was fairly high in terms of journal articles, but low in terms of textbooks, chapters in books, co-authored books, monographs and conference proceedings. Findings also show that their research publications were relevant to their career progress. Of the several sources of workload issues of academic librarians, inadequate staffing ranked highest as reported in the study. It also revealed that academic librarians experience heavy workload and that the workload they experience impacts their publication output negatively. The study concluded by recommending among others that, the University management should employ more staff to relieve academic librarians of their heavy workloads so as to give them ample time for conducting research thereby enhancing their publication output, professional progress and career advancement. The study relates to the present in the use of total enumeration as a sampling procedure but differ in the design.

Methodology

The paper adopted ex-post research design. Emaikwu (2010) defines ex-post-facto-research as that in which independent variable or variables have already occurred and in which the researcher starts with the observation of a dependent variable or variables. The existing phenomenon in this study is research output which is the dependent variable while awareness and use of open access journals is the causative agent. Using Emaikwu's viewpoint as presented above, it is assumed that the dependent variable (research output of academic librarians) can only be certain if the academic librarians are aware of and if they use the independent variable (open access journals) for research activities. Open access journals which are independent variables are already in existence. The research will therefore consider whether research output of academic librarians in university libraries in the study area will be high due to their awareness and use of the journals. Ten percent of open access journals from the list provided in the Directory of Open Access Journals (DOAJ) by Bhaskar (2010) was randomly selected. The use of North Central was purposively considered due to its central location among geo-political zones in the country while public universities were preferred due to the authors' perception that, the universities are better funded and should be able to mediate access to open access journals for use by academic librarians. Total enumeration method was used to reach out to the entire population of 209 academic librarians in all the 13 public or government owned universities

(seven Federal and six State owned) in North Central Nigeria using a self constructed questionnaire for the purpose of data collection. One hundred and sixty (160) copies of questionnaire were returned in good condition representing 77% return rate. The 160 questionnaires were used for data analysis. The questionnaire was validated and trial tested. Trial testing was done using Cronbach Alpha statistics and showed an overall coefficient of 0.97 which indicated that, the instrument was highly reliable and was adopted for this study. Academic librarians were chosen as population of the study because they are custodians of university information resources as well as researchers themselves who are expected to access the materials for their clientele and also for themselves. Data collected were analysed using weighted mean and standard deviation to answer research questions while Pearson's product moment correlation coefficient was used to test hypothesis at 0.05 level of significance. Specifically, for each research question, real limit of numbers were used to determine the decision level as follows: 3.50 and above: Very High Extent (VHE); 2.50 – 3.49: High Extent (HE); 1.50 – 2.49: Low Extent (LE); 0.00 – 1.49: Very Low Extent (VLE) and 3.50 & above: Strongly Agree (SA); 2.50 – 3.49: Agree (A); 1.50 – 2.49: Disagree (D); 0.00 – 1.49: Strongly Disagree (SD) were used. Hypothesis is rejected if the associated probability figure is less than the value of the significant figure (0.05). Distribution of the population among universities is presented in the table below.

Table 1: Distribution of the population among universities

S/No	Location	Unive rsity	Number Distribu ted	Number Returned	Percentage returned	Number Lost	Percen tage Lost
1	Benue	UAM	20	18	90.00	02	10.0
		BSU	21	16	76.19	05	23.8
2	Nassarawa	FULaf ia	08	07	87.5	01	12.5
		NSUK	10	06	60.0	04	40.0
3	Kogi	FULo koja	10	08	80.0	02	20.0
		KSUA	15	15	100.0	00	00.0
4	Plateau	UJos	25	15	60.0	10	40.0
		PSUB	10	06	60.0	04	40.0
5	Niger	FUT M	27	26	96.10	01	3.70
		IBBU	20	20	100.0	00	00.0
6	Kwara	UniLo rin	20	11	55.0	09	45.0
		KSU M	10	07	70.0	03	30.0
7	FCT	UniAb j	13	05	38.5	08	61.54
Total				209		160	49

Key: **UAM**: Federal University of Agriculture, Makurdi; **BSU**: Benue State University, Makurdi; **FULafia**: Federal University, Lafia; **NSUK**: Nasarawa State University, Keffi; **FULokoja**: Federal University, Lokoja; **KSUA**: Kogi State University, Anyigba; **UJos**: University of

Jos, Jos; **PSUB**: Plateau State University, Bokkos; **FUTM**: Federal University of Technology, Minna; **IBBU**: Ibrahim Badamasi Babangida University, Lapai; **UniLorin**: University of Ilorin, Ilorin; **KSUM**: Kwara State University, Maletе; **UniAbuja**: University of Abuja, Abuja.

Data Presentation

Demographic Information

Table 1: Sex Distribution of the Population

S/No	Universities	Frequency	Percentage
1	Male	98	61.3
2	Female	62	38.8
Total		100	100

Table 1 shows the sex distribution of the population. 98 respondents representing 61.3% of the population were male while 62 respondents (38.8%) were

female. This implies that, there are more male than female librarians in university libraries in North Central Nigeria.

Table 2: Educational Qualification

S/No	Qualification	Frequency	Percentage
1	Post Graduate Diploma in Librarianship	11	6.9
2	First Degree in Librarianship	66	41.3
3	MLS	68	42.5
4	Ph.D in Librarianship	11	6.9
5	Others	4	2.5
Total		160	100.0

Table 2 which is educational qualification indicated that, out of the 160 librarians covered in the study, 68 (42.5%) of the respondents were holders of Masters of Library and Information

Science (MLS) followed by those with first Degree in Librarianship (66; 41.3% of respondents). The least was others which numbered only 4 respondents (2.5%).

Table 3: Mean Response of Academic Librarians on the Extent of Open Access Journals Usage

Usage		N=160		
S/No	Open Access Journals	Mean (\bar{x})	Std Deviation	Decision
1.	Bulletin of the Medical Library Association	2.31	.93	LE
2.	Cybrarians Journal	2.03	.90	LE
3.	D-Lib Magazine	2.24	.93	LE
4.	Electronic Journal of Knowledge Management	2.56	.84	HE
5.	Evidence Based Library and Information Practice	2.53	1.78	HE
6.	Interdisciplinary Journal of Information, Knowledge, and Management	2.49	.92	LE
7.	Journal of eLiteracy	2.49	.94	LE
8.	Journal of Information Literacy	2.57	.90	HE
9.	Liber Quarterly:	2.33	1.03	LE
10.	Library Philosophy and Practice	2.63	1.07	HE
11.	Library Student Journal	2.46	1.00	LE

Key: HE- High Extent; LE- Low Extent; VLE

Table 3 shows the extent of usage of open access journals by academic librarians in North Central Nigeria for research purposes. Respondents exhibited high extent of use of 4 of the journals (items 4, 5, 8 and 10 with mean of 2.56, 2.53, 2.57 and 2.63 respectively) with mean values between 2.5 to 3.49. Respondents also show low

extent of usage of 7 open access journals listed (items 1, 2, 3, 6, 7, 9 and 11) all of which had mean values ranging from 1.50 to 2.49. This implies that, academic librarians in North Central Nigeria used open access journals at different extents (high and low extents). It also shows that, while the librarians use open access journals,

URL: <http://journals.covenantuniversity.edu.ng/index.php/cjlis/>

the extent of use is generally low considering that the journals whose extent of usage is low are more (7) than those whose usage is high (4).

Research Question 2. What are the benefits derived from open access

journals by academic librarians to promote their research output?

Research question two sought to find out the benefits that academic librarians derived from open access journals to promote their research output. Analysis of data in respect to research question two is presented in table 4.

Table 4: Mean Responses of Academic Librarians on Benefits Derived from Open Access Journals to Promote their Research Output

N=160

S/No.	Benefits of OAJs	Mean \bar{x}	Std. Deviation	Decision
1.	I get free online access to the literature necessary for my research	3.21	.83	Agree
2.	It increases impact of my work	3.33	.63	Agree
3.	It makes easy accessibility of my research work	3.33	.67	Agree
4.	It makes publications free for me as an author	2.82	.83	Agree
5.	It reduces publication delay	3.03	.72	Agree
6.	It makes access to articles free online	3.07	.77	Agree
7.	It increases citation to published scholarly work	3.18	.72	Agree
8.	It increases visibility of my articles	3.21	.65	Agree
9.	It promotes my university's ranking	3.15	.71	Agree
10.	It facilitates efficient dissemination of research findings	3.16	.75	Agree
11.	It eliminates postage difficulties and ensures immediacy	3.12	.75	Agree
Cluster Mean (\bar{x}) and SD		3.14	.50	11/11

Table 4 shows the benefits derived from open access journals by the academic librarians to promote their research output. All the items ranging from increase in impact of their work (3.33), easy accessibility of research work (3.33), free online access to the literature necessary for the research (3.21) to free publications for author (2.82) were agreed upon as benefits

derived from open access journals having obtained mean values between 2.50-3.49. This indicated that respondents' agreed that academic librarians in university libraries in North Central Nigeria benefits from open access journals for the purpose of research. The benefits are likely to attract academic librarians to the use of the journals as well as act as a propelling factor to increased research output.

Research Question 3: What is the publications output of librarians in University libraries in North Central Nigeria?

Research question three sought to find out the publication or research output of

academic librarians in university libraries in North Central Nigeria. The data collected to answer the research question is hereby presented in tables 5 and 6.

Table 5: Mean Responses of Academic Librarians on their Research/Publications Output

Research Output	Mean (\bar{x})	Std. Deviation
1. Above 20 Articles in Learned Journals	1.75	.70
2. 11-20 ”	1.92	.85
3. 6-10 “	2.03	.87
4. 1-5 “	2.33	1.01
5. 6-10 Chapters in books	1.86	.80
6. 1-5 “	2.53	.99
7. 6-10 Coauthored books	1.74	.64
8. 1-5 “	2.29	.93
9. 6-10 Conference papers	2.10	.97
10. 1-5 “	2.34	.97
11. 1-5 Textbooks	2.18	.94

Table 6: Grand Mean of Publications Output of Academic Librarians

	Mean	Std. Deviation
Grand mean of articles in learned journals	2.00	.39
Grand mean of chapters in books	2.20	.61
Grand mean of coauthored textbooks	2.20	.61
Grand mean of conference papers	2.22	.61
Grand mean of Textbooks	2.18	.94

Table 5 shows publications output of librarians in University libraries in North Central Nigeria. The responses show the mean values ranging from 1.74 to 2.53. Table 6 shows the grand mean

of each of the publications. Result here shows that all the publications (articles in learned journals, chapters in books, coauthored textbooks, conference papers and Textbooks) had grand mean ranging from 2.00 to 2.22 (standard deviation .39 to .61). Conference papers had the

highest mean response of 2.22 followed by chapters in books and coauthored textbooks (2.20 each). The least are textbooks (2.18) and articles in learned journals (2.00). All the mean ratings are between 1.50 and 2.49 indicating that the output is generally low. This implies that, the publication or research output

of academic librarians in North Central Nigeria is low.

Hypothesis One (HO₁):

HO₁: No significant relationship exists between use of open access journals and research output of academic librarians in Universities in North Central Nigeria.

Table 7: Correlation analysis of Test of Significant Relationship between Use of Open Access Journals and Research Output of Academic Librarians in University Libraries in North Central Nigeria

	Mean	Std. Deviation	N	Corr.	Sig. (2-tailed)	Remarks
Extent of use of OAJs by academic librarians	2.50	.59	160	.28	.000	Significant
Publication output of academic librarians	2.10	.43	160			

The mean scores of extent of use of OAJs by academic librarians is 2.5 and standard deviation is 0.59 while that of publication output of academic librarians is 2.10 and standard deviation is 0.43. Correlation coefficient is 0.28 and the associated probability for the relationship is $.000 = p$. Since p is less than 0.05, the relationship is significant and the hypothesis is rejected. There is therefore a significant relationship between use of open access journals and research output of academic librarians in universities in North Central Nigeria. This implies that, when there is high extent of use of the journals by academic librarians, then their publication output will also be high but a low extent or level of use of open access journals will lead to low publication or research output of the librarians, other things being equal.

However, challenges associated with the use of open access journals like poor

Internet connectivity, time constraint and others are capable of altering the expected equilibrium.

Discussion of the Findings

The study, extent of usage of open access journals by academic librarians in North Central Nigeria for research purposes exhibited high extent of use of 4 out of the 11 open access journals listed. This implies that, the number of open access journals with high extent of use (4) is less than the ones with low extent of use (7). Though open access journals are used by academic librarians in North Central Nigeria, the extent of use is not the same. Since the number of journals with high extent of use is less than the ones with low extent, it portends that, generally the extent of use is low.

These findings are in line with those of Ivwighreghweta and Onoride (2012) who studied awareness and use of open access journals by LIS Students at the University of Ibadan and discovered that, students' use of open access journals is still far from expected even though the students show great willingness to use free sources of information. Obaseki, Nkwoma and Ukachi (2013) disclosed that though librarians are aware of e-publishing, they have not been publishing in them as expected.

Findings also show that, increase in impact of work, easy accessibility of research work, free online access to the literature necessary for the research and free publications for author were benefits derive from open access journals by academic librarians in North-Central Nigeria for the purpose of research. If these benefits are enjoyed by academic librarians, it implies that, publication or research output of the librarians will be high which will also improve university rating.

In line with this, Ezema, (2013) reported that, an increase in the visibility of the authors, promotion of university ranking and efficient dissemination of research findings were among the benefits of publishing in institutional repositories. Eysenbach (2006) agreed that open access (OA) to the research literature has the potential to accelerate recognition and dissemination of research findings. The result is expected because, all innovations are expected to come with a number of benefits and open access journals should not be an exception.

Findings also show publications output of librarians in University libraries in North Central Nigeria which was generally low as the grand mean of all the items fell within 1.50-2.49 of real limit of numbers. It was however highest in chapters of books and coauthored textbooks. This related to the findings of Adegbaye, Okorie, Wagwu and Ajiboye (2019) that, academic librarians' publication output was fairly high in terms of journal articles, but low in terms of textbooks, chapters in books, co-authored books, monographs and conference proceedings.

Findings from hypothesis revealed a significant relationship between the use of open access journals and research output of academic librarians in universities in North Central Nigeria. Musa (2015) collaborated that, a significant relationship was established between awareness and use of Open Access resources for research productivity of academic librarians in Federal universities in North Western States of Nigeria.

Conclusion

respect to the findings of this study it is concluded that, academic librarians in North-Central Nigeria shows different extents of use (high and low extents) of the open access journals for research output as shown in table 3. A number of benefits are derived from the use of the journals for research purposes including increase in impact of work, easy accessibility of research work, free online access to the literature necessary for the research and free publications for author. The use of the journals has however led to low increase in different research outputs (conference papers,

chapters in books, coauthored books and others). Though the respondents use open access journals and benefit from them, their research output is yet low. There are perhaps some underlining challenges that the academic librarians may be grappling with which shall be further investigated.

Recommendations

The following recommendations are made from the findings of the study:

1. Universities in North Central Nigeria should increase budgetary provision so as to make substantial subscription to relevant full text databases. With these, the universities should ensure that, e-journals are readily available for use by academic librarians and other academics.

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2. Academic librarians in university libraries in North Central Nigeria should be encouraged by the library management to use more of the open access journals since they derive benefits from their use.
3. Universities are hereby encouraged to release content of university based publications to public domain to enable academic librarians and other academics to access and use for the purpose of increasing publications output. Academic librarians in North Central Nigeria on the other hand should be encouraged to create time to use the existing open access journals to write and publish research results. This will help increase their research output which is found to be generally low.

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