

Open Access and Scholarly Publishing: Opportunities and Challenges to Nigerian Researchers

Oghenetega Iwighrehweta
Western Delta University
Nigeria
anthonyoghenetega@yahoo.com

Oghenovo Kelvin Onoriode
Western Delta University
Nigeria
onosovo@yahoo.com

ABSTRACT: The study examined the extent of researchers' appreciation of open access scholarly publishing. It discussed the opportunities and the benefits of open access to scholars worldwide. Challenges of OA were discussed and solutions suggested. Four research questions were raised. The population of this study was 140 lecturers from the University of Benin, Nigeria. The study revealed that the respondents had cited open access journals articles and that the major benefit derived from using open access journals is that it provides free online access to the literature necessary for research.

I. Introduction

There is a rapidly expanding stock of scientific knowledge. Yet access to this pool of knowledge is often difficult because of the relatively high cost of scholarly journals, print or electronic (Okoye & Ejikeme, 2010). Many African countries spend a lot on research. Yet only few individuals have access to the research findings. Restricted access to knowledge restricts the development of science and has severe effects on the general well-being of people. Libraries in the developed world struggle to purchase access to all the scientific publications they need while subscriptions are prohibitively expensive for institutions in the developing world, particularly in Africa (Antelman, 2004). Removing access barriers will accelerate research, enrich education and share learning. There is, therefore, a critical need to make research findings available to as many academics as possible free of charge. Because of this need, concerned institutions and organizations felt challenged. The Budapest Open Access Initiative advocates that scientific knowledge does not need to be published in forms that make access expensive. (Velterop, 2005)

Open access (OA) publishing has been defined in several ways but it is generally known to involve the free availability of the findings of research mainly in the form of scholarly articles. Access is usually in an electronic form via the Internet. For authors, OA can be achieved in two primary methods:

- Publishing articles in open access journals (OAJ)
- Depositing copies of articles in open access archives (OAA) or repositories often referred to as self-archiving

These two parallel but complementary paths for achieving OA are sometimes referred to as the “Gold Road” (i.e., publish in an OAJ) and Green Road to open access (i.e., published in a non OAJ but deposited in an OAA) (Harnad et al., 2004).

The Berlin Declaration on Open Access to Knowledge in the Science and Humanities (2003) defines open access (OA) as a new mode of scholarly communication, through which the author(s) and right holder(s) of scholarly work grant(s) to all users a free, irrevocable, worldwide right of access to, and a license to copy, use, distribute, transmit, and display the work publicly and to make and distribute derivative works in any digital medium for any responsible purpose, subject to proper attribution of authorship. According to this definition, a complete version of the work and all supplemental materials, including a copy of the permission to use, should be deposited in at least one online repository using the suitable technical standards to enable open access, unrestricted distribution, and long-term archiving of such works.

The new form of scholarly communication is achieved through two main channels: Open Access Journals (OAJ) for electronic refereed journals and Self-archiving (Chan & Costa, 2005, p. 149). On the other hand, both Bethesda Statement on Open Access Publishing (2003) and Berlin Declaration on Open Access to Knowledge in the Science and Humanities (2003) agree that for a work to be OA, the copyright holder must consent in advance to let users “copy, use, distribute, transmit and display the work publicly and to make and distribute derivative work in any digital medium for any responsible purpose, subject to proper attribution of authorship”.

Open access is of vital importance to developing countries, which often do not have the capital necessary to access scholarly literature. Although schemes like JSTOR, OARE (Online Access to Research in the Environment), EBSCOhost, and HINARI (Health InterNetwork Access to Research Initiative) sponsored by the World Health Organization do give access to scholarly literature at little or no cost, they, however, have restrictions because individual researchers may not register as users unless their institutions have access (Okoye and Ejikeme, 2010).

Open access journals

Open access journals, also referred to as “Gold Road” to open access, are peer-reviewed journals that are free of charge to the public through the Internet.

Unlike the business publishing model, in open access publishing, the end user is not charged to access journal articles. Instead, various funding strategies such as direct author fees, institutional membership to sponsor all or part of author fees, funding agency payment of author fees, grants to open access publishers, and institutional subsidies are used to cover the costs for publication

and distribution of OA content for free access by the end user (Hirwade & Rajyalakshmi, 2006). Some of the open access journal avenues for direct access include DOAJ (Directory of Open Access Journals), the Directory of Free Full-Text Journals in Chemistry (<http://www.abc.chemistry.bsu.by/current>), Free Medical Journals (<http://www.freemedicaljournals.com>), and the Free Online Full-text Articles by HighWire (<http://highwire.stanford.edu/lists/freart.dtl>). It is also possible to access open access journal articles indirectly by using search engines such Google or Google scholar.

Several studies have been carried out on OAJ, which highlight the benefits as follows:

- Free access to information
- Increased research impart (measured by citations/downloads) of open access articles versus non-open articles (Antelman, 2004)
- Possible solution to the so-called “serial crisis” or “journal affordability problem”

Okoye and Ejikeme (2010) identified the benefits of using open access journals to include the followings:

- It provides increased citation to published scholarly work.
- Publications are made free for authors.
- It increases the impact of researchers’ work.
- Articles can be accessed online free of charge.
- It provides free online access to the literature necessary for one’s research.
- It helps in career development.
- It provides high quality scholarly work.

Self-archiving

Self-archiving, also referred to as “Green Road” to open access, is making articles freely available in digital form on the Internet by authors (Budapest Open Access Initiative, 2002). There are three most common ways of self-archiving on the Internet:

- authors’ personal websites
- disciplinary (research-specific) repositories
- institutional repositories (Bjork, 2004)

The Registry of Open Access Repositories (ROAR) and the Directory of Open Access Repositories (DOAR) provide the list of open access compliant archives from disciplinary and institutional archives worldwide. As the case with open access journals, articles from ROAR or DOAR may be accessed through direct search of respective repositories/directories or indirectly using other search engines.

Harnard et al (2004) noted that there were many advocates of open access who believe that scholars should continue to publish their articles in traditional subscription based journals but at the same time, should upload open access copies of the paper to subject-based or institutional e-

print repositories. This alternative mode of open access is often referred to as green route as opposed to the gold route of the journals themselves being open access.

Opportunities with Open Access Publishing

OA has presented many opportunities to all stakeholders. Suber (2004) eloquently spelled out opportunities presented by OA to various groups of people:

Authors: OA gives them a worldwide audience, larger than that of any subscription-based journals, no matter how prestigious or popular, and probably increases the visibility and impact of their work.

Readers: OA gives them barrier-free access to the literature they need for their research, not constrained by the budgets of the libraries where they may have access privileges. It increases their convenience, reach, and retrieval power.

Libraries: OA solves the pricing crisis for scholarly journals. It also solves the permission crisis. OA serves library's interests in other indirect ways, too. Librarians want to help users find the information they need, regardless of the budget-enforced limits on the library's own collection. Librarians want to help faculty increase their audience and impact and thereby help the university raise its research profile.

Universities: OA increases the visibility of their faculty and institution, reduces their expenses for journals, and advances their mission to share knowledge.

Journals and publishers: OA makes their articles more visible, discoverable, retrievable, and useful. If a journal is OA, then it can use this superior visibility to attract submissions and advertising, not to mention readers and citations.

Funding agencies: OA increases the return on their investment in research, making the results of the funded research more widely available, more discoverable, more retrievable, and more useful. OA serves public funding agencies by providing public access to the results of publicly-funded research.

Governments: As funders of research, governments benefit from OA in all the ways that funding agencies do. OA also promotes democracy by sharing government information as rapidly and widely as possible.

Citizens: OA gives them access to peer-reviewed research (most of which is unavailable in public libraries) and gives them access to the research, for which they have already paid through their taxes. It also helps them indirectly by helping the researchers, physicians, manufacturers, technologists, and others who make use of cutting-edge research for their benefit.

A growing number of studies have confirmed that an OA article is more likely to be used and cited than one behind subscription barriers. There is enough evidence that OA documents are most likely to be cited than non OA documents. This gives OA authors an advantage over other

authors, who are skeptical about OA. Scholars are paid by research funders and/or their universities to do research; the published article is the report of the work they have done, rather than an item for commercial gain. The more the article is used, cited, applied and built upon, the better for research as well as for the researcher's career (Suber 2004).

According to Cetto (2001), OA goes beyond the academic circle and spreads its wings to other areas. An OA article can be read by anyone, including professionals, researchers in different fields, media practitioners, politicians, civil servants, etc. OA articles can often be found with a web search, using any general search engine or those specialized for the scholarly/scientific literature. He stated that librarians believe that OA promises to remove both the price barriers and the permission barriers that undermine library efforts to provide access to journal articles. Most library associations have either signed major open access declarations or created their own. In most universities, the library houses the institutional repository, which provides free access to scholarly work of the university's faculty. Some OA advocates believe that institutional repositories will play a very important role in responding to OA mandates from funders (Cetto, 2001).

Most African countries cannot afford books. Most of these books are available internationally but quite expensive by African standards. This is where OA comes in. In Africa, researchers, students, and scholars in general get materials via OA. This way, they are able to obtain the latest, updated materials otherwise beyond their reach (Hamel, 2005).

Challenges to Open Access Publishing

There is sufficient basis to suggest that part of the reasons for the low profile of scientists in Africa is the poor access to scientific publications from the developed countries, exacerbated by the institution of copyright (Tagler, 1996). What developing countries needs is an initiative or arrangement that will provide scientists with free access to scientific publications irrespective of where the sources are developed (Nwangwu & Ahmed, 2009).

Moller (2004) pointed out that despite many opportunities that present themselves, many countries in developing nations are yet to utilize the privilege offered by these resources to internationalize their research sources. Many African countries and institutions have not encouraged faculty and students to contribute to or access OA materials. On a positive note, some universities like the University of Western Cape have launched an Open Content project to have students and staff participate in OA. African scholars have continually relied on e-papers from developed countries.

According to Antelman, (2004), language is a major barrier in Nigeria. Nigeria has different official languages. Most online literature and OA materials are in English. Resistance to change has been seen as another challenge. There are many librarians, researchers, readers and authors who have resisted the change to the e-world. Some librarians believe that if they embrace the electronic publications completely, their jobs will be at risk. There are researchers and authors in Africa who have kept their research findings from publishing for fear that others will know about their findings. No wonder an old saying agrees with this that the richest place on earth is the graveyard, where many unexploited ideas are buried with their owners (Antelman, 2004).

Hamel (2005) stated that technologically, many African countries, especially Nigeria, lack the infrastructure to handle OA materials. Telecommunication challenges like bandwidth allocation, and weak communication and social infrastructure have not only blocked information flows but ultimately stifled social and economic development. Internet connection is a key to OA. Despite a very rapid rate of the Internet growth, Africa still lags behind in Internet connectivity with barely 1% of Internauts in Africa and the Middle East. Scientists who are not connected to the Internet are excluded automatically from publishing in, and benefiting from, a growing number of journals, because many new journals are created online while many old ones now often have online counterparts.

Much has been said about the information rich and information poor. In other words, there is a digital divide in that two distinct worlds exist. According to DiMaggio et al. (2001), digital divide refers to inequalities in access to the Internet, extent of use, knowledge of search strategies, quality of technical connections and social support, ability to evaluate the quality of information, and diversity of uses. The digital-divide underpins much of the ongoing discourse on whether ICT can be harnessed for mitigating poverty in developing countries with several voices arguing that those who live on less than \$1 a day have no need for ICTs. The proponents of ICTs, on the other hand, consider ICTs as tools that can be used to provide the poor with economic opportunities and improvement in human well-being (UNCTAD, 2003).

The Africa Tertiary Institutions Connectivity Survey (ATICS) carried out by the African Virtual University in 2005 showed that on average, an African university had the bandwidth capacity equivalent to a broadband residential connection available in Europe, paid 50 times more for their bandwidth than their educational counterparts in the rest of the world, and failed to monitor, let alone manage, the existing bandwidth (ATICS, 2005). As a result, what little bandwidth that is available becomes even less useful for research and education purposes. Arunachalam (2002) pointed out that the gulf in the levels of science and technology between the developed and the developing countries will tend to widen further with the rapid expansion of the Internet in the West and the speedy transition to electronic publishing.

Although OA offers free access to information, there needs to be some funding to take care of Internet subscriptions, designing of tools, management, and availing technology. Most African economies are constrained or have other priorities and would invest in OA only if their budgets have surplus (Raney, 1998).

Suber (2004) listed four major challenges to the success of OA:

- Filtering and censorship barriers. Many schools, employers, and governments want to limit what users can see.
- Language barriers. Most online literature is in English, or just one language, and machine translation is very weak.
- Handicap access barriers. Most web sites are not yet as accessible to handicapped users as they should be.
- Connectivity barriers. The digital divide keeps billions of people, including millions of serious scholars, offline.

II. Objectives of the Study

The current study is to understand the level of usage of open access articles by lecturers in University of Benin, Nigeria. To be specific, what are the benefits for lecturers derived from using open access journals, what are the constraints to open access in scholarly publishing, and what are the strategies to enhance open access to scholarly publications?

III. Research Methodology

The study employed a descriptive survey design, utilizing a questionnaire to collect data. The population of the survey consisted of 140 lecturers at the University of Benin, Benin City, Nigeria.

Copies of the questionnaire were randomly administered to 140 lecturers. All distributed copies of the questionnaire were completed and retrieved. The data were analyzed using frequency counts and simple percentage to answer the research questions.

IV. Findings of the Study

The findings of this study are presented in the following tables with a brief summary.

Table 1: Distribution of Respondents by Gender

Gender	No of Respondents	Percentage
Male	97	69%
Female	42	31%
Total	140	100%

Table 1 shows that 92 (69%) of the respondents are male while 42 (31%) are female.

Table 2: Distribution of Respondents by Age

Age range	No of respondents	Percentage
25 – 35 years	5	4%
36 – 45 years	45	32%
46 – 55 years	74	53%
56 and above	16	11%
Total	140	100%

Table 2 shows that 74 (53%) lecturers are in the age range of 46-55 years old, followed by 45 lecturers (32%) in the age range of 36-45 years old, 16 (11%) lecturers in the age range of 56 years or older, and 5 (4%) lecturers in the age range of 25–35 years old.

Table 3: Educational Qualification of Respondents

Academic degrees	No of Respondents	Percentage
MA/MSC	62	44%
BSC/BA	9	6%

Ph.D	69	49%
TOTAL	140	100%

Table 3 shows that 69 (49%) respondents have Ph.D. degree, followed by 62 (44%) lecturers with MA or MSC, and 9 (6%) lecturers with BSC or BA.

Research Question 1:

What is the level of usage of open access articles by lecturers of the University of Benin?

Table 4: Level of Usage of Open Access Journals by Lecturers

OA Journal Usage	HU		U		UN		HUN		Total	
	No	%	No	%	No	%	No	%	No	%
I refer open access journals.	72	51	54	39	9	6	5	4	140	100
I print open access journals articles.	68	49	49	35	14	10	9	6	140	100
I cite open access journals.	68	49	60	43	9	6	3	2	140	100
I have made links to other articles through open access journals.	59	42	63	45	11	8	7	5	140	100
I publish my work in open access journals.	76	54	46	33	10	7	8	6	140	100
I have downloaded articles from open access journals.	83	59	38	27	14	10	5	4	140	100
I access open access journals.	86	61	28	20	18	13	8	6	140	100
I copy open access journals articles to USB flash drive.	66	47	52	37	15	11	7	5	140	100
I read articles in open access journals.	81	58	42	30	10	7	7	5	140	100
I browse for articles in open access journals.	77	55	39	28	18	13	6	4	140	100

Notes: HU = highly used; U = used; UN = unused; HUN = highly unused

Table 4 shows that the level of usage of open access journals by lecturers is high. All the questions listed in the table have received a high response. It is interesting to see that 128 (92%) respondents indicated that they cited open access journals in their research and that 126 (90%) used open access journals as bibliographic references.

Research Question 2:

What are the benefits for lecturers derived from using open access journals?

Table 5: Benefits for lecturers derived from open access journals

Benefits	SA		A		D		SD		Total	
	No	%	No	%	No	%	No	%	No	%
OAJ provides free online access to the literature necessary for my research.	80	57	47	34	10	7	3	2	140	100
OAJ increases impact of researchers work.	78	56	46	33	14	10	2	1	140	100
OAJ makes for easy accessibility of the research work.	84	60	38	27	12	9	6	4	140	100
OAJ makes it possible for self-archiving.	82	59	38	27	12	9	8	6	140	100
OAJ helps in career development.	68	49	56	40	6	4	10	7	140	100
OAJ makes publication free for author.	76	54	50	36	12	9	2	1	140	100
OAJ reduces publication delay.	70	50	36	26	22	16	12	9	140	100
OAJ provides increased citation to published scholarly work.	73	52	40	29	18	13	9	6	140	100

Notes: SA = strongly agree; A = agree; D = disagree; SD = strongly disagree

Table 5 shows that there are many benefits for lecturers derived from open access journals. All the statements listed in the table have received very positive responses. For example, 80 respondents (57%) strongly agree that OA journals provide free online access to the literature necessary for their research and another 47 (34%) respondents agree with that statement.

Research Question 3:

What are the constraints to the use of open access in scholarly publishing?

Table 6: Constraints to the use of open access articles

Constraints	SA		A		D		SD		Total	
	No	%	No	%	No	%	No	%	No	%
Unavailability of Internet facilities	60	43	68	49	10	7	2	1	140	100
Download delay	56	41	59	42	13	9	10	7	140	100
Limited access to computer terminals	72	51	40	29	15	11	13	9	140	100

Lack of knowledge of OAJ existence	70	50	54	36	8	6	8	6	140	100
Power outage	76	56	40	29	12	9	10	7	140	100
Improper archiving of some open access journals	80	54	40	29	13	9	7	5	140	100
Lack of Internet search skills	82	59	39	28	13	9	6	4	140	100

Notes: SA = strongly agree; A = agree; D = disagree; SD = strongly disagree

Table 6 shows that there are many constraints to the use of open access articles. 60 (43%) respondents strongly agree and 68 (49) agree that unavailability of Internet facilities is a constraint to the use of OA. 70 (50%) respondents strongly agree and 54 (36%) agree that lack of knowledge of the existence of OAJ is also a factor.

Research Question 4:

What are the strategies to enhance open access for scholarly publications?

Table 7: Strategies to enhance open access for scholarly publications

Strategies	SA		A		D		SD		Total	
	No	%	No	%	No	%	No	%	No	%
Publish more open access journals	20	14	17	12	75	54	28	20	140	100
Improve Internet connectivity	85	61	30	21	15	11	10	7	140	100
Supply constant power	30	21	14	10	72	51	24	17	140	100
Establish institutional repositories	66	47	42	30	20	14	12	9	140	100
Provide government funding for OA movement	19	14	30	21	58	41	33	24	140	100

Notes: SA = strongly agree; A = agree; D = disagree; SD = strongly disagree

Table 7 shows the responses to the strategies suggested by the authors to enhance open access to scholarly publications. 85 (61%) respondents strongly agree and 30 (21%) agree that the Internet connectivity needs to be improved.

V. Conclusion

The respondents indicated overwhelmingly that they cite open access journals. This finding is in conformity with what Suber (2004) indicated that researchers cite more open access journal articles than those behind subscription barriers and that the more an article is used, cited, applied, and built upon, the better for research as well as for the researcher's career.

It was found that the major benefit derived from using open access journals is that it provides free online access to the literature necessary for research. This finding is in conformity with what Okoye and Ejikeme (2010) indicated that OAJs provide free online access to the literature necessary for one's research.

It was also found that unavailability of Internet facilities is a major constraint to the use of open access scholarly publications. This finding is in conformity with what Suber (2004) stated that connectivity barriers keep billions of people, including millions of serious scholars, offline.

Meanwhile, the majority of the respondents agreed that a strategy to enhance open access publications is to improve Internet connectivity. This finding is in conformity with what Arunachalam (2002) pointed out that the digital divide between the developed and the developing countries need to be closed in order to enhance electronic publishing.

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Authors:

Oghenetega Ivwighreghweta, Head of Readers Services, Western Delta University, Oghara Delta State, Nigeria. E-mail: anthonyoghenetega@yahoo.com

Oghenovo Kelvin Onoriode, Technical Service/ICT Librarian, Western Delta University, Oghara, Delta State, Nigeria. E-mail: onosovo@yahoo.com

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