# THE INFLUENCE OF THE OPEN ACCESS MOVEMENT ON FACULTY RESEARCH OUTPUT AND UNIVERSITY LIBRARIES IN AFRICA

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## Abstract

*Based on literature review, the purpose of this paper is to explore the state of the OA movement in African universities, its influence on university libraries and research output by faculty. As an innovative form of scholarly communication within the digital environment, the Open Access (OA) movement presents equal opportunities to every member of society and guarantees equal and universal access to information and knowledge. It seeks to reduce the access and knowledge divide thus allow researchers from developed and developing countries to contribute to enriching human knowledge as well as bridging the global North-South research divide. This movement was led by the quantitative increase in scientific information across the world , with a number of implications, which include; rapid growth of research articles, excessive increase in journal prices/subscription imposed by commercial publishers and tight library budgets for purchase of these journals that hardly ever rose.*

*Owing to this, most African countries before OA resources struggled to obtain access to journals due to un affordable journal prices just as in developed countries, but to a greater extent and consequently with greater negative repercussions. With OA movement, African scholars are able to share their thoughts and exchange information with one another for example in universities, OA provides an alternative model of scholarly publishing to free online access, promotes freedom of inquiry and full and open availability of scholarly literature on a global scale. Currently, university libraries of Africa have played an active role in the expansion of the OA movement by promoting it in a variety of ways, such as: including records for OA journals in their public catalogues and e-journal lists, collaborating with their institutions to establish institutional repositories, participating in, and at times, leading institutional initiatives to encourage faculty to deposit their work in the institution's repository. On the other hand, university faculties have been teaching, researching, producing scholarly works and responsible to publish in OA journals and self-archive their work in their institutional repositories (IR). Although OA has been significant to universities in Africa, there are discussions*

*about the quality of OA publications from Africa that has brought the rise of predatory journal publishers; a challenge that is affecting most university scholars in the region. To this, the researcher recommends that those enforcing compliance and quality should quest those publishers to make sure that all journal publishers surrender their publications to indexers and use bibliometric methods to judge their quality, influence and impact.*

**Keywords**: *Open Access; OA; Open Access movement, Africa, Universities; University libraries; Librarians*

## Introduction

Traditional subscription based on scientific journals has access limitations; articles are inaccessible to the majority since access is based on the users' ability to pay. This makes access to such research literature discriminatory (Sarah, 2013). Open access (OA) movement is a humanitarian movement (Shuva & Taisir, 2016) that is focused on giving scientific information to those who do not have it thus addresses perceived inequities of access to scientific information (Nwagwu, 2013). It presents equal opportunities, guarantees equal and universal access to information and knowledge for every member of society via the internet without any or minimum financial cost, economic, legal or technical other than those intrinsic to the Internet (Chan et al., 2005; Drott, 2006; Uddin, 2014; Poynder, 2015; Shuva & Taisir, 2016; Ayeni , 2017). Users are free to read, download, copy, distribute, print, search or link to the full text of OA works (Drott, 2006). OA seeks to reduce the access and knowledge divide and allow researchers from developed and developing regions to contribute to enriching human knowledge (Ahmed, 2007; Eloff et al., 2013; Fernandez, 2006; Ghosh & Das, 2007; Herb, 2010; Veletsianos & Kimmons, 2012) as well as bridge the global North-South research divide (Adcock & Fottrell, 2008). Additionally, it promotes freedom of inquiry, full and open availability of scientific information on a global scale in university circles (Nwagwu, 2016). Removing access barriers to literature is considered a humanitarian right to access knowledge which is vital for developing countries (Rens and Kahn, 2009) as it enriches education, accelerates research, shares the learning of the rich with the poor and vice versa. Increased access to this literature is an essential pillar for sustainable development (Bradley, 2016) as it lays the foundation for uniting humanity in a common intellectual conversation and quest for knowledge (Budapest Open Access Initiative (BOAI), Open Society Institute, 2001).

The primary and traditional role of universities is the generation and transmission of knowledge and the training of minds. But more importantly is to engage in research that could lead to the contribution of knowledge. Before the

advent of the Internet, universities relied heavily on research articles in journals mostly published by commercial publishing houses and made available by subscription to libraries that could afford them (Bashorun, Jain, Sebina, & Kalusopa , 2013). OA emerged as a global movement in the academic sphere providing an alternative model of scholarly publishing to free online access to scholarly literature. The OA movement was led by the quantitative increase in scientific information across the world attributed by the rapid growth of research articles, the rapid growth of specific journals, the increase in prices of journal subscriptions, and the tight library budgets that hardly ever rose (Arora, 2008; Oppenheim, 2008; Suber, 2002). As a consequence, academic institutions and libraries were forced to cut down on journal subscriptions and this created access limitations to educational resources as libraries and scholars could not get most of the required literature deemed necessary in their scholarly work which hindered research in all fields of knowledge (Alemu, 2009). The situation was particularly critical for small colleges and universities and quiet unacceptable for institutions in the developing world where budgets were non-existent (ibid).

As university library budgets continued to shrink, and fail to keep up with inflated serial costs, it became a concern that prompted many university libraries globally, to consider other means of providing research output with an alternative model for a wider and faster distribution of scholarly work without cost or at a lower cost or even for free or with no copyright barriers to end users. Therefore, the birth of OA which is viewed as one of the means of addressing the escalating journal prices as well as addressing the problem of limited access to information to an increasing volume of scientific literature (Lynch 2003; Möller, 2006; Oppenheim, 2008; Mullen, Laura Bowering, 2010) was the remedy for some libraries. For low and middle-income countries (LMIC) where most African countries belong, OA breaks traditional financial barriers and allows unrestricted, equal access to scholarly information (Tennant, et al., 2016). Although it is the global pattern, the level of awareness and deployment of OA movement follows the paths of digital advantage (McNeill, 2007). The movement gained tremendous pace, perhaps due to the development in technology and increased global access to the internet (Oppenheim, 2008; Björk & Hedlund, 2012).

The OA publications can be delivered through two broad ways; the gold OA and green OA routes (BOAI, 2002; Oppenheim, 2008; Harris, 2012). Gold OA often referred to as the author-pays-model, developed by publishers, payment for publication fees or processing charges is made by either the author, the author's parent institution, research funder or another source of author-side funding so that the resulting paper can be read by anyone, anywhere, without the requirement to pay for access or wait for an embargo period (Uddin,

Koehlmoos, & Hossain , 2014). Papers can be published under the gold OA model in gold OA journals, or in hybrid journals, where some authors pay to make their papers OA while other papers are published under the traditional subscription model (Oppenheim, 2008; Harris, 2012). The Green OA route is where self-archiving of accepted authors' manuscripts or other pre-publication versions are either deposited in institutional and/or subject repositories or a combination of them. The business model for green OA publishing is simply that the body maintaining the repository pays for ingest of materials, addition of metadata and other technical and administrative requirements (Oppenheim, 2008; Harris, 2012). This approach works with traditional subscription publishing but many publishers impose embargo periods and particular conditions on publication on self-archiving (Sherpa/Romeo, 2018). Nevertheless, the two approaches do not compete but rather play complimentary roles. Therefore the adoption of either or all the routes leads to the dissemination of research output across the world. While OA diminishes costs of production and distribution, other costs remain. Anderson (2004) noted that for information to be made freely and permanently available to the public, the costs of creation, publication, and distribution must be absorbed by someone other than those who wish to use it. The internet eliminates most distribution costs, but not all of them.

According to the Directory of Open Access Journals (DOAJ, 2012), the OA movement has a longer history in Sciences and Medicine than in other disciplines such as the Humanities and Social Sciences. However, the acceptance of OA has continued to spread throughout other disciplines. As of 18th January 2018, there were 10,925 OA journals registered in the Directory of Open Access Journals (DOAJ) representing 123 countries, of which 698 journals were from Africa.

In this paper, University libraries were chosen since they play key roles in information access in their institutions. These roles include collection development, managing subscription budgets, providing advice on information access, managing institutional collections, and reporting on usage of resources and services (Harris, 2012). Though this is common in traditional libraries, the roles are still core and still remain even in the OA world. Similarly, with so many universities in Africa, a lot of research is conducted through faculty academic work for different reasons including promotion and tenure, writing of thesis/dissertations as a requirement for the award of degrees, PhDs and therefore require dissemination of their research and access to research findings (Ezema, 2011). For research output to have influence, it ought to be accessible and applicable for all, thus create an impact on Africans as well as contribute to the global knowledge generation and development. Over the previous years, research generated over the years in African universities was buried in physical

libraries in Africa, with very few scholars and students accessing them (Christian, 2008; Ezema, 2010). This meant that African researchers highly depended on information generated from the developed countries of Europe and the USA, thus reducing Africa to only information consumers in the global information environment (Eczema, 2011). Additionally, the limited circulation of scholarly publications resulted in the call for a way of fashioning out a proper method of disseminating scholarly research in developing countries, so as to balance the global information equation and improve the visibility and impact of research outputs in the region. OA movement is therefore a new approach that has enabled African scholars in universities to share their thoughts and exchange information with one another (Nwagwu, 2016).

In this paper, research output includes research papers that have been published in journals, conferences, and dissertations and thesis published in IRs. A faculty member is the professional who is teaching, researching, and producing scholarly works thus generate knowledge for sustainable development.

The purpose of this paper is to explore the state of the OA movement in African universities and university libraries, its influence on university libraries and research output by faculty.

## Methodology

The data for this paper was collected from secondary sources by reviewing literature on the theme. The scope of the analysis was directed by the nature of the available data in general and on Africa in particular. Literature was selected from online databases (Elsevier, Emerald, Sage, Eric and Ebsco Host), International Federation of Library Associations (IFLA), print and electronic journals, conference proceedings, Google scholar, text books, websites and reports.

## The state of the Open Access Movement in Africa

Available evidence suggests that due to the high prices of journal subscriptions from commercial journal publishers, developing countries struggle with access to academic information just as in developed countries, but to a greater extent and consequently with greater negative repercussions (Tennant *et al*, 2016). Scientific research findings locked behind the pay wall journals are not disseminated widely, and this leads to restricted readership and thus reducing their impact (Albert, 2006; Bjork, Roos , & Lauri, 2009). For example, in 1982 a research paper indicating why Liberia should be included in the ebola endemic zone was published under a pay wall journal, and this information was not known to Liberian officials during the 2014 ebola outbreak (Knobloch cited in

Tennant, et al., 2016). The paper was not easily discovered nor accessed, although the abstract was available in the pay walled article, evaluating the truth of the result definitely necessitated access to the full research article. In general, lack of access to information can have major adverse consequences for students and researchers, because of insufficient information to conduct their own primary research. Thus, free access to information is a prerequisite for information sharing and reuse, promotes equity, which the OA movement can provide to Africans. Since OA to scientific information is free, there is an increased audience to this information, which leads to further creation of knowledge and solutions to problems as the communication becomes more open, cheaper, easier and rapid (Ahmed, 2007).

Coupled with poor funding and the rising cost of journals, Okunoye & Karsten's (2003) observed that most university libraries in sub-Saharan Africa had to reduce the number of subscribed journals, consequently partnerships and open access models became priority items on their agendas (Prooser, 2004). In Uganda for example, Makerere University's library budget for serial publications was heavily affected by the "serials crisis" at the close of the 20th Century. In the year 2000, subscriptions to print journals that were the main source of current research literature at the University were almost scrapped off the institution's budget due to the high journal subscriptions (Kakai, 2009). This made Makerere University library suffer a research literature vacuum for some time. Fortunately, in 2001 the university was involved in a pilot phase of access to online journals under the Programme for the Enhancement of Research Information (PERI) run by the International Network for the Availability of Scientific Publications (INASP). After the INASP pilot phase, access to online journals were later supported by Sida/SAREC, with subscriptions to about 20,000 full-text online journal titles accessed country-wide by academic and research institutions in Uganda. At the time, other free online journal databases were identified and added onto the list. Access to the electronic journals calmed the situation at Makerere University, but did not eradicate the need for an online database of local scientific research (Kakai, 2009).

Given the fact that a number of researchers publish in journals owned by database owners that were still not affordable, even with external funding, it was deemed necessary to recollect such findings by advocating for self-archiving Makerere University researchers' publications in the institution repository (IR) which led to the birth of an IR at Makerere University. In relation to this, Crow (2002) pointed out that institutional repositories serve as meaningful indicators of an institutions academic quality. He further pointed out that much as the intellectual output and value of an institution's intellectual property is diffused through thousands of scholarly journals, an IR provides an avenue of concentrating the intellectual product created by a university's researchers,

making it easier to demonstrate its scientific, social, financial value and thus contribute solutions to society problems.

With respect to the efforts aimed at institutionalizing open access, South Africa has made significant progress in gold open access in the past five years. Although the first open access journals in Africa actually started in Egypt with three entries in DOAJ 2002, Egypt declined in 2003 and 2004 when the DOAJ listed South Africa with three published journals in each of the years (Nwagwu, 2012). However, as of 4th February 2017, DOAJ reveals that Egypt leads in Africa with 597 journals, followed by South Africa with 62 Journals (DOAJ, 2018). Further thousands of researchers in Africa publish in international OA journals such as BIOMed Central (www.biomedcentral.com) and Public Library of Scoence - (PLoS)- (www.plos.com). In 2017, over 600 OA journals published in Africa from 15 countries were indexed in the DOAJ (DOAJ, 2017) as seen in table 1:

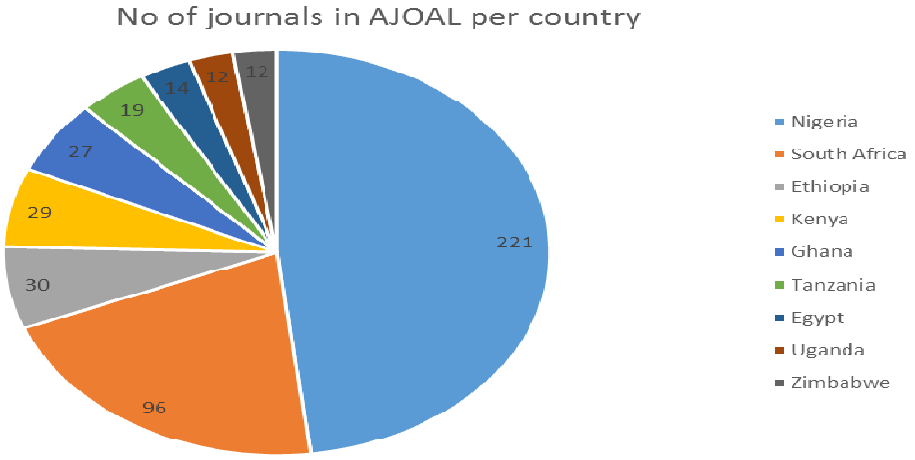
**Table 1: No of African journals indexed in DOAJ**

| SR NO. | Country | No of journals published in DOAJ |
|---|---|---|
| 1 | Egypt | 597 |
| 2 | South Africa | 62 |
| 3 | Algeria | 9 |
| 4 | Nigeria | 8 |
| 5 | Morocco | 6 |
| 6 | Ethiopia | 3 |
| 7 | Ghana | 2 |
| 8 | Kenya | 2 |
| 9 | Libya | 2 |
| 10 | Tunisia | 2 |
| 11 | Cameroon | 1 |
| 12 | Congo, Republic | 1 |
| 13 | Madagascar | 1 |
| 14 | Mauritius | 1 |
| 15 | Uganda | 1 |
| | | 698Total |

Source http://doaj.org 04.02.2017

As of 17th January, 2018 the African Journals Online (AJOL) (the world's largest and pre-eminent collection of peer-reviewed, African-published scholarly journals) had 521 journals and 880 Journal articles, including 221 Open Access Journals, 12743 Issues containing 149,206 abstracts, 143,423 full text articles for download, of which 82,208 are OA from nine (9) African countries. AJOL exists to make African origin research output accessible to Africans and the rest of the world. As seen in Figure 1, Nigeria has the highest number of journals (221) followed by South Africa with (96), Ethiopia (30), Kenya (29), Ghana (27), Tanzania (19), Egypt (14), Uganda and Zimbabwe each with (12) journals respectively. Most of the other African countries had less than 10 journals listed in AJOL database.

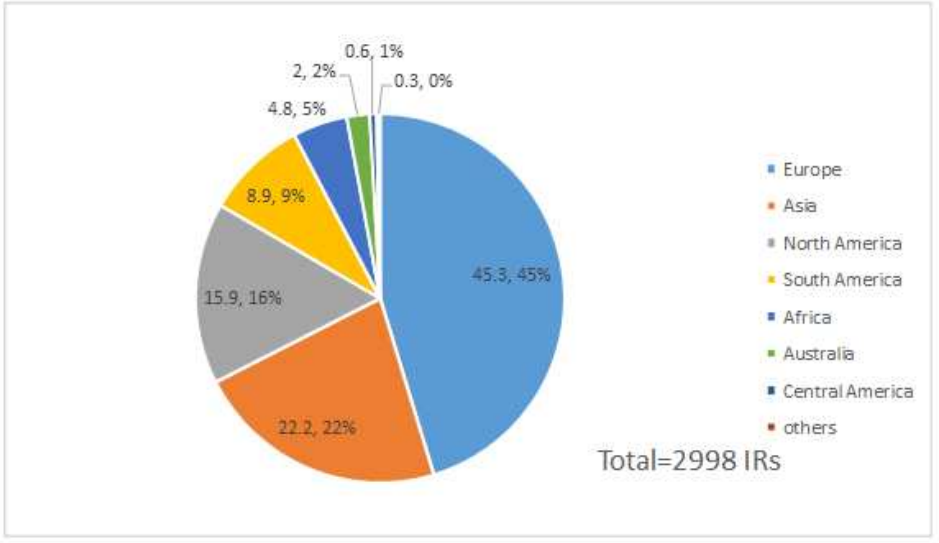
**Figure 1: Showing examples of countries with the highest number of journals in the AJOL database**




Source: http://www.ajol.info/index.php/index/index, 17th .01.2018

In addition, as of 17th January, 2018 Africa had 143 (4.8%) IRs (OAR), of the 2998 world's IRs (Directory of Open Access Repositories, 2018).

**Figure 2: Proportion of Institutional Repositories by continent-worldwide.**




Source: http://www.opendoar.org/onechart.php, 17th January 2017

Most of the institutional repositories in OpenDOAR are from universities where theses and dissertations constitute the majority of the content type followed by journal articles. Similarly, according to the (Directory of Open Access Scholarly Resources (ROAD), 2017) as of 20th October 2017, there were 348 publications from Africa of the world's 22505 publications.

There are other OA initiatives in Africa that recognize and establish the local and regional OA movement, driven by collaborative African research such as, Africa Portal, an online resource that seeks to broaden the availability, accessibility and use of research issues and policy briefs critical to Africa (AfricaPortal, 2017). Equally, in an effort to promote OA in Africa, on 29-30th January, 2015 UNESCO and NetWork of African Science Academies (NASAC), the Royal Netherlands Academy of Arts and Science, Kenya National Academy of Sciences and Kenya Ministry of Education, Sciences and Technology organized a consultative forum that took place in Kenya, and brought on board 20 African countries to provide expert intervention for research and development in Africa.

It was also observed from the literature and from several OA policy websites that most African countries and universities have not adopted and implemented open access policies. For example, as of 17th January 2018, only 32 African universities and other research institutions in 12 African countries had implemented open access policies and thesis mandates with (EIFL, 2018). Similarly, as of 17th January 2018 the Registry of Open Access Repository Mandates and Policies (ROARMAP), 2018) had only 24 registered policies from Africa (Eastern Africa-10, Northern Africa-3, Southern Africa-9, and West Africa-2) in the whole of 54 African countries. This number is low compared to other continents like Europe (546) and America (214). According to sherpa/romeo, (2018) as of 17th January 2018, only 41 universities and other institutions from 13 countries have signed OA policies with Sherpa/romeo. In line with this, (Nwagwu, 2016) noted that the adoption of templates of open access policies from developed countries by African countries may result in further challenges to science development in the region if not addressed by the stakeholders. Other OA African initiatives include the scholarly communication in Africa (SCA), 2017) programme that aim at increasing African universities contribution to regional and global knowledge production. However, there is also evidence of individual open access initiatives and new publishing houses in Africa that are largely underdeveloped and sometimes predatory (Nwagwu, 2016). These new and upcoming open access initiatives and publishing houses in Africa provide answers for younger and weaker scholars who do not care about the quality of journals in which they publish (Nwagwu, 2016).

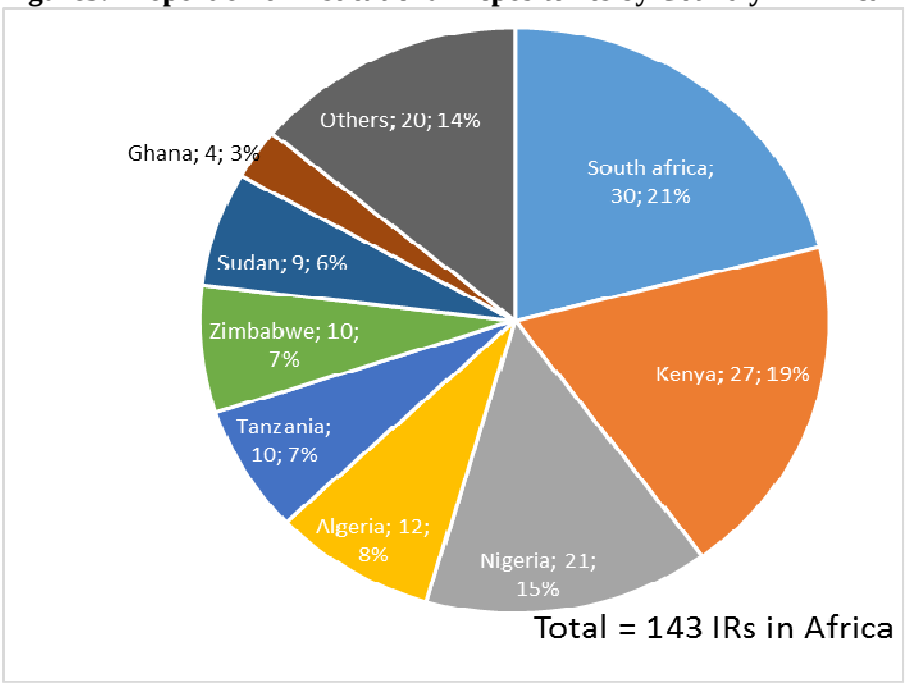
Although there are OA activities and initiatives in Africa, it is observed that, there is a low level of research in many African countries. Even AJOL, a database dedicated to indexing journals from Africa has limited journals compared to the countries in Africa. In line with this, Mammo and Ngulube (2015) and Nwagwu (2016) observed that the situation above is partly brought by the lack of OA policies in most African universities, the low level of social and technological development, low internet bandwidth, poor champions (University Librarians), lack of awareness by faculty, and limited funding both at institutional and government level . The same author further noted that, there exists an informal expression of concern about the quality of sources through which scholars are publishing, but similar concern about what students and their teachers are reading is not pronounced. This confirms an earlier study by (Nwagwu, 2006) who observed that the benefits of open access to Africa were still tied to the generosity of the developed countries, and that African home-grown initiatives were few and economically not strong.

**The influence of the open access movement on university libraries and faculty research output in Africa**

In libraries, the movement toward integrating free digital scholarly material and products has certainly affected the technical services area in many ways most prominently the development of IRs that have been initiated and operated by academic librarians and encouraging teaching faculty to self-archive all their scholarly works (Carter et al., 2007; King et al. 2006; Palmer et al., 2009; Mullen, 2010). And University Libraries are using these IRs to collect their institution's publications (Harris, 2012), which enhances visibility of the university's research output.

Previous studies indicate that there has been progress in the establishment of IRs in university libraries in Africa. A study by Kakai (2009) indicated that in 2009 the African continent had 23 visible institutional repositories from eight (8) countries with 15 IRs from South Africa. An earlier work by Christian (2008) reported that Africa had twenty (20) IRs with 14 from South Africa; Chilimo (2015) reported ninety-four that Africa had 94 (4%) of the repositories worldwide) with 42 (44%) from South Africa. In this study as of 23rd January 2018, there were at least 143 IRs in Africa of the listed of the 2998 IRs worldwide. According to OpenDOAR South Africa is leading with 30 (21%), Kenya 27 (19%), Nigeria 21 (15%), Algeria 12 (8%), Tanzania 10 (7%), Zimbabwe 10 (7%) Sudan 9 (6%), Ghana, 4 (3%) while other countries 20 (14%) (Directory of Open Access Repository, 2018). However, this number continues to change as more IRs are listed every day. The chart in figure 3 below is based on the number of IRs in each country.

**Figure3: Proportion of Institutional Repositories by Country in Africa**




Source: http://opendoar.org, 23rd January 2018

It is observed that many more universities in Africa are in the process of developing their IRs. Some of them are already on the World Wide Web (or Web) but not yet listed in OpenDOAR, and some still operate on their institutions' local area network (LAN), for example in Uganda; Uganda Martyrs University (2017) and Uganda Christian University (2017) have IRs on their websites but not yet registered in the OpenDOAR database. Even though there is evidence of IRs in Africa, from the above data and as compared to the number of repositories (2998 repositories) worldwide, it is observed that most African universities have not yet positioned themselves globally for research sharing and visibility therefore, the extent of OA impact in Africa remains to be seen.

In addition, university libraries have played an active role in the expansion of the OA movement by promoting it in a variety of ways, such as: including records for OA journals in their public catalogues and e-journal lists, collaborating with their institutions to establish IRs, participating in, and at times, leading institutional initiatives to encourage faculty to deposit their work in the institution's repository, digitizing historical collection and being active OA publication contributors (for self-archiving) and consumers (for access,

reading, and citing), and managing OA repositories (Carter et al., 2007; King et al. 2006; Palmer et al., 2009 ; Cryer & Collins, 2011).

University librarians are well-positioned to assist researchers in using data throughout their workflow, from background work to discovering existing data sets, through developing protocols for capturing data to disseminating data through their institutional repositories (Luce, 2008; Reilly et al., 2011). Libraries have been providing E-resources to users in higher institutions and have connections to institutional repository initiatives. The wider discussions of scholarly communication means that librarians have played "a natural leadership role for data services, as they are the one place in their institution that sees the broad picture across all constituents or subject disciplines" (Tenopir, 2013).
University libraries have traditionally provided faculty support by concentrating on the "end products" of scholarship such as journal articles, in addition to providing assistance and instruction in information discovery, and may be ideally situated to assume a more active role in offering data management assistance in the OA movement (Jaguszewski & Williams, 2013; Tenopir, 2013). Kriegeskorte & Deca (2012) pointed out that OA is widely accepted as desirable and has become a reality in many academic spheres, (Tennant, et al., 2016) argued that OA affects academia through association with a higher documented impact of scholarly articles, as an outcome of open availability of these articles that are used as teaching medium for lectures or continued research (De beer & Jennifer, 2005; Thaotip, 2011).

The major arguments in favor of OA in universities include the evidence that work that is openly available leads to greater audience, generates more academic citations and the speed of citation accumulation (Tennant, et al., 2016; Aman, 2014; Gentil-Becot, Mele, & Brooks, 2010; Thaotip, 2011; Swan & Brown (2005). In line with this, several studies (Kurtz, et al 2005; Eysenbach, 2006; Henneken et al, 2006) found out that the average number of citation of OA articles was higher compared to non-OA articles. It was also observed that in journals that were widely available in libraries, open access articles were more recognized and cited by peers than non-OA articles published in the same journals. Pandian et. al, (2008) found out that, OA articles were cited 25-250% more than non-open access articles from the same journal, giving the users access to and use of full text of all the scholarly journal articles.

It was observed from the literature that the more citations the publication of a researcher attracts, the higher the impact and influence of a researcher become (Solms & Solms, 2016). Moreover, citation counts remain fundamental for academic impact as the 'currency units' for researchers, research groups, institutes and universities (Diamond AM as cited in Piwowar, Day, & Fridsma,

2007; Tennant, et al., 2016). This in turn motivates university researchers for more author publications, increases the research impact factor of authors and universities leading to visibility of the university, researchers and high research rankings. It is believed that university research output demonstrates academic success both to the researchers and sponsoring institutions. With this, university academics are on pressure to "publish or perish" or else their career suffers as a result (Solms & Solms, 2016). Solms and Solms (2016) further points out that research output can be deemed as good or worthwhile if they are read, used and/or cited by others thus making an impact. However, research that is not disseminated would not be seen, read, used or cited by others. Such research can be deemed unproductive, or even useless (Crow, 2002). It is therefore better to publish in OA journals because it offers a wider audience to use, cite and extend the field of knowledge even further. However, (Swan, 2010) cautioned that citing ones work rests upon the quality, relevance, originality and influence of the piece of work. As such better articles from OA will gain more as they will be cited more. The author further adds that, research output that does not add or adds little or nothing at all to the development of knowledge in a particular field receive little or no citation from other researchers, even if the research findings can be readily accessed. Since most, if not all, researchers investigate to make an impact and nurture their research influence, researchers should attempt to exploit the number of citations that their research publications attain (University of Western Australia, 2016; Kelly & Jennions, 2006).

In addition, licensed OA works play a major role in university education, including re-use in classes and for research dissertations and thesis (Tennant, et al., 2016). University authors frequently give the copyright to the publishers in exchange for the perceived prestige of publishing in one of their venues. Müller-Langer and Watt (2010) for example, noted that in the years before the OA movement, the professional publishers acted as third party that simply filtered the research in terms of quality and organized it into convenient packages, which it then sold back to the scientific community in the form of journals. Open access signifies a power shift from publisher-owned to author-owned rights to research (Shavell, 2010; Tennant, et al., 2016). This shift allows for wider re-use of research information (Tennant, et al., 2016).

The other argument in favor of OA among universities is that, OA allows academic researchers to use automated tools to mine the scholarly literature which forms the basis for a robust scholarly ecosystem (Tennant, et al., 2016). Bloudoff-Indelicato (2015) noted that, to mine OA journals, one only needs the technical skills. Yet, to mine closed access journals, one needs to sign or negotiate access conditions, even if legitimate access to the articles has already been bought. Text and data mining (TDM) is not only a knowledge-generation tool; it also allows for automated screening for errors and automated literature

searches that renew scientific discovery (Pal, 2011). With TDM it becomes possible to easily compare the researcher's results with those of the published literature, identify convergence of evidence and enable knowledge discovery (Chen & Liu, 2004; Natarajan *et al.*, 2006). TDM also decreases the time dedicated to the search for relevant information in the vast amount of scholarly literature by categorizing information, highlighting and annotating relevant results according to users' needs and research profile, which saves the time of the researcher (Leitner & Valencia, 2008; Shatkay *et al.*, 2008; Porter *et al.*, 2002; Harmston, Filsell, & Stumpf, 2010)

The overall OA movement has become conjoined with the drive for Open Data and this has led to data sharing. Publicly sharing data is fundamental to scientific progress, because data leads to the knowledge generated in research articles, allows other researchers to examine results and reproduce and validate research results / experiments, examine new hypotheses, identify any methodological errors, minimize duplication of resources, and enables the exploration of topics not visualized by the primary investigators and ensures the sustainability and integrity of stored data (Gurria, 2007; Hanson, Sugden , & Alberts, 2011; (Reilly, Schallier, Schrimpf, Smit, & Wilkinson, 2011; Borgman, 2012; Thessen &Patterson, 2011 ; Vision, 2010).

Although there are hundreds of possible benefits of the OA movement to university libraries and scholars, there are debates about the quality of OA publications and the danger of making erroneous scientific publications OA (Shuva & Taisir, 2016). For example, there has been the emergence of predatory journal publishers that charge authors for their publication without giving quality peer-review, copy-editing, and indexing services and moreover, with the content not valid or not validated (Butler, 2013; Tin et al 2014). As pointed out by several authors, the history of predatory journals, and the identity of their proprietors, is often unknown. There is no archiving practice leading to lack of access to their back numbers, and there is doubt about the sincerity of their locations (Beall, 2012, Beall, 2015; Berger & Cirasella, 2015; Butler, 2013),

The term predatory was first used by Jeffrey Beall, a librarian at Colorado University in 2010 and thereafter he developed a list of predatory publishers that unprofessionally exploit the OA model for profit. Beall has ever since maintained a regularly updated list of ''potential, possible, or probable predatory scholarly open-access journals'' on his website until 2017 when the list went missing. Predatory journals exploit the idea of the author pays gold model by setting up bogus publishing operations and charging a fee but not providing the promised publishing services in return, predatory journal publishers do not follow accepted scholarly publishing industry standards and

seek only to profit from author fees and often target authors who are afraid of peer reviews (Bohannon, 2013; Beall, 2012).

In 2016, predatory journals nearly rose to 930 (Beall, 2016). While sometimes publicly accessible via Internet searches of the specific journal or publisher, these publications are not indexed in reputable library systems (e.g., PubMed) and are undiscoverable through the standard searches. Several authors have pointed out that most of these journals emanate from Africa (Xia 2015; Nwagwu, 2016). In line with this (Ngwagwu & Makhubela, 2017) adds that this has been mostly brought by the poor and unprofessional manner in which most OA publishers from Africa are conducting scholarly publishing. Nevertheless, in an earlier study (Nwagwu, 2013) pointed out that, although many of these so-called predatory journals and clusters might actually be fake; some could be Africa initiatives whose products and proprietors might be considered to have limited or lack of OA resources (Nwagwu, 2013).

Researchers have been found to fall victim (prey) of using predatory OA journals for their research activities and this has serious implication for the integrity of their research output in the international scholarly community (Ayeni , 2017). In Africa, a study at the Centre for Africa on evaluation, science and technology at Stenllenbosch University found out that between 2005 and 2004, more than 4,200 South African academic articles were published in 47 journals classified as predatory (Africa check, 2017).

The 'publish or perish' mentality among most universities has prompted authors to haphazardly publish in any journal which has little or no peer review requirement (Xia, 2015). Young researchers and doctoral students in Africa are considered to be the major victims of "predatory" journals, a problem catalyzed by an increasing pressure on them to "publish or perish" (Shaw, 2013).

Using predatory journals has gross negative influence on the quality of one's work. Since the information published in such articles is deprived of thorough peer review and standardization, such articles would therefore be less qualitative. Such articles are likely to be full of plagiarized ideas that damage the integrity of the authors and his/her institutions. If such works are used for knowledge acquisition and teaching, there would be less qualitative learning, which cannot stand the test of time, especially in scholarly writing (Ayeni, 2017). If the issue of predatory journals is not controlled, it is likely to increase the knowledge divide, which may lead to African researchers being excluded from the knowledge sharing society. In line with this, Shuva and Taisir (2016) suggested that authors interested in submitting their papers to open access journals should first ask the following questions: Does the journal offer a blind peer-review process? What is the impact factor of the journal? Does the journal

ensure reasonable speed of publication after acceptance? Is the editorial board comprised of figures internationally recognized in their respective subject fields? Is the information about the editorial board clear (university affiliation, institutional email addresses of the editorial board members, the online presence of the editorial board members, etc.)?

## Conclusion

In view of the significance of the OA movement in Africa, it becomes evident that universities and university libraries have made strenuous efforts to ensure continued access to scholarly information. University libraries have been active in including records for OA journals in their public catalogues and e-journal lists, collaborating with their institutions to establish institutional repositories, participating in, and at times, leading institutional initiatives to encourage faculty to deposit their work in the institution's repository. The OA movement has enabled African scholars in universities to share their thoughts both nationally and internationally. However, **t**he OA movement has stemmed with problems like predatory publishing that has likely been brought by the slagon "Publish or Perish". This has been the greatest challenge that affects most African university scholars. The literature further indicated that the uptake of open access has been low in African universities as compared to universities from developed countries as revealed by statistics in the number of IRs, OA journals, adoption and implementation of OA policies from Africa as compared to the western world. This is due to the fact that OA depends more on information technology and yet technology infrastructure in Africa is still underdeveloped. And as such African university scholars are seen mostly as users rather than contributors to global knowledge generation and sharing. There is also poor championship by University Librarians in initiating OA, lack of awareness by faculty, and limited funding both at institutional and government level.

## Recommendations

- University librarians should put in more effort to spearhead OA initiatives.
- University Librarians should explain OA benefits to both university staff and students
- The University librarians should encourage teaching faculty colleagues to publish in OA journals.
- University faculty should archive all their scholarly work given that majority of contribution of information materials in the OA journals and IR is expected from them.
- University librarians and faculty professionals should aim at making the OA movement a success through collaborative work. It should be clear to

Librarians and Faculty staff that without their collaborative effort it will be hard to realize the effect of OA in African universities.

- University authors should use their research outputs to enhance their University global visibility through OA journals
- Scholarly publishing in OA reputable journal outlets should be imperative in universities, University faculties should be mindful of how to choose relevant and reliable peer reviewed OA journals before submitting manuscripts for publication to avoid publishing in predatory journals. To this, those enforcing compliance and quality should quest those publishers to make sure that all journal publishers surrender their publications to indexers and use bibliometric methods to judge their quality, influence and impact. In addition, there is also a great need for African researchers to carefully investigate the reputation of OA journals before sending their work for publication or visit the DOAJ, use open access evaluation sites such as http://thinkchecksubmit.org and http://scimagojr.com before submitting their research for publication.
- University publishers should aim at building their reputation step by step through publishing with reputable OA journals.
- University faculty should avoid publishing in predatory journals where there is little or poor quality peer review.
- Careful investigations should be carried out prior to publishing with any journals in case they turn out to be predatory journals.

- There is need to study the adoption and implementation of OA policies in universities this will help shed some light on how to successfully develop IRs.
- Finally, this paper was based on literature review. The topic can be further investigated through an empirical research to understand the context based on participants' perspective from different stakeholders implementing OA in universities of Africa

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