# Examining the Diffusion and Adoption of Open Access Publishing among Academics at the University of Limpopo, South Africa

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## Abstract

This study examined the diffusion and adoption of open access (OA) publishing among 250 academic staff members at the University of Limpopo (UL), South Africa. The study was guided by Rogers's Diffusion of Innovation (DoI) theory to measure their (the academics') level of awareness on the availability of OA platforms, to determine their adoption and usage levels of OA publishing for scholarly communication, to establish their attitudes towards the use of the OA publishing platforms, and to identify their perspectives with regard to challenges and benefits presented by OA publishing. A questionnaire was used as a data collection instrument. The findings revealed that most academics were, "to some extent," aware of OA publishing, through their subject librarians and the internet. Although most were "strongly in favour" of OA publishing, their level of adopting it was lower than expected. The institutional repository (IR) was found to be the OA platform they have used most frequently to upload journal articles. Article processing charges (APCs), connectivity related issues, articles not being peer reviewed, predatory publishers, and lack of knowledge and OA access policies remain some of the challenges encountered in adopting OA publishing. It is recommended that the library staff should intensify its OA publishing marketing strategies and educate academics about its implications through workshops and seminars. Rewards for academics who publish in OA platforms should also be considered by the institution, and the academics who are reaping the benefits of OA publishing should also showcase their rewards to the other academics.

**Keywords:** open access publishing; diffusion; adoption; academic staff; University of Limpopo; scholarly publishing

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## Introduction

Scholarly information sources such as conference proceedings, books, theses and dissertations, book chapters and articles in scholarly journals remain vehicles through which scientific research output is shared among academics in different disciplines across academic and research institutions (Waithaka and Onyancha 2021). Nonetheless, access to these scientific resources, especially articles in scholarly journals, is tarnished by what is referred to as a "crisis in scholarly communication and publishing," which ensued from collection budget cuts for academic libraries, demand for new and expensive library resources, and an increase in prices of serial publications and database subscriptions (Collister, Deliyannides, and Dyas-Correia 2014). This crisis occasioned the initiation of open access (OA) publishing by academic libraries across the world (McCready and Molls 2018). OA is a new innovation to ensure that scholarly and scientific literature is freely available and accessible to the public via the internet (Chilimo and Onyancha 2018). This innovation offers numerous benefits that would have been impossible in traditional scholarly journal publishing modes in as far as access to scholarly literature is concerned (Parker 2013, 112). Studies that examined the benefits of OA have revealed cost saving in terms of journal subscription, greater journal impact, more author visibility, more citations, as well as wider access to the most current information and scientific ideas (Brink 2013; Fullard 2007; Tennant et al. 2016).

Academic libraries in different countries across the world have, therefore, been advocating and propagating its purported benefits (Bangani 2018; Lewney 2021). The National Research Foundation (NRF 2015) has, likewise, adopted a statement on OA publishing in science and research. Similarly, the Academy of Science of South Africa has made some South African journals freely available and accessible through the Scientific Electronic Library Online SA (SciELO SA) platform (Lambert 2019). Several universities in countries across the world, South Africa included, have also adopted policy guidelines by which OA publishing should be managed, including signing the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities initiative (BOAI), and they created IRs to facilitate access, dissemination, reuse and preservation of the work arising from the scientific and academic activity of their staff (Anunobi and Ape 2018, 35; Serrano-Vicente, Melero, and Abadal 2016, 595). Furthermore, universities participate in the International Open Access Week, an event that is celebrated annually in October, for "advocacy, policy campaign, promotion and awareness raising on issues related to open access to scholarly literature, open science data and self-archiving" (UNESCO 2015, 45).

Likewise, the University of Limpopo (UL) has also established its own electronic thesis and dissertation portal through its institutional repository (IR) to provide free access to digitised special collections and research materials of the UL and affiliated institutions. Through the IR, the UL library also contains and preserves theses and dissertations, research articles, conference papers, rare and special collections and many other forms of digital information generated within the institution. Like other universities, the UL

library recognised the importance of OA and spearheaded the drafting of the OA policy and mandates at the institution and further signed the BOAI in 2018 (Committee of Higher Education Libraries of South Africa [CHELSA] 2021, 15). Although universities have adopted their own institutional OA policies and IRs, it is not sufficient to create change in the habits of academics in embracing the new innovation (Serrano-Vicente, Melero, and Abadal 2016). The response from the academics seems to be slow (CHELSA 2021, 45). In as much as there are academics who supported the open access initiative by contributing articles, conference proceedings, theses and dissertations to the IR and other OA platforms, there is still a need to examine how they became aware of OA and the extent to which they are adopting the innovation. A study of this nature may be of help in building the foundation upon which management of the institution develops programmes that will promote OA publishing. The study may also help academic libraries to develop strategies to convince academics to adopt and use the relevant OA publishing platforms. Adoption of such platforms may enhance research dissemination, scholarly publishing and communication in the institution. Therefore, the aim of this study was to examine the diffusion and adoption of open access (OA) publishing among academic staff members at UL. The objectives of the study are:

- to measure their level of awareness on the availability and use of OA resources;
- to determine their adoption and usage levels of OA publishing;
- to establish their attitudes towards the use of the OA publishing platforms; and
- to identify their perspectives with regard to challenges and benefits presented by OA publishing.

## Literature Review

This section looks at the theoretical framework on which this study is grounded, namely, the Diffusion of Innovation (DoI) theory (Rogers 1995), as well as the review of previous literature related to OA publishing aligned to the study's research objectives.

### Theoretical Framework

The diffusion and adoption of OA publishing in any university environment can best be studied if looked upon from the perspectives of the DoI theory developed by Rogers in 1995. Rogers (1995) explains DoI as a theory that analyses and helps explain the adoption of new innovations in a social system. An innovation is an idea, practice or object, which in this study is OA publishing. Diffusion is the process by which an innovation is communicated through certain channels over time among members of a social system. Four main elements identified in this theory are innovation, communication channel, time and the social system (Rogers 1995). A communication channel is a means by which messages get from one individual to another about a new innovation in the social system. The time dimension in the DoI theory is involved in diffusion in three ways, namely, the innovation-decision process, innovativeness, and

the rate of adoption. The fourth main element in the DoI theory is the social system, which is defined as a set of interrelated units engaged in joint problem-solving to accomplish a common goal (Rogers 1995, 10). The DoI theory further postulates that certain characteristics, namely, relative advantage, compatibility, complexity, trialability and observability as perceived by members of the social system determine the rate at which an innovation is adopted. All these characteristics influence decisions by members of the social system to adopt or reject a new innovation. In this study, OA publishing as an innovation was studied to find out how it has been communicated to academics and the extent to which the new innovation has been adopted by academics at UL.

## Open Access Publishing as an Innovation

OA publishing as an innovation has been defined by Eve (2015, 718) as the "economic reconfigurations of removing price tags and permission barriers to access scholarly research." It is basically the dissemination of scholarly research on the internet to allow readers to access work without paying. Johnson (2014, 516) defines OA publishing as "a condition in which scholarly content is made available to users without charge and needless of copyright and licensing restrictions via the internet." According to Jain (2012, par 6), OA has the following characteristics:

- It is free availability of scholarly publications;
- It is free of copyright and licensing restrictions;
- Materials are available online or on the internet;
- Materials are full text and can be accessed by anybody from anywhere without any discrimination; and
- Materials can be freely used by anyone.

Through this model of scholarly communication academics are able to get free access to scholarly content. However, academics may still be subjected to article processing charges (APCs) when they decide to publish on OA platforms. Suber (2012) explains OA publishing as an online platform that is free of charge and free of most copyright and licensing restrictions, and he further points out that there is less academic freedom when academics work for royalties and make their research articles commodities rather than gifts.

## Awareness of OA Publishing

For individual academics to publish their works on OA platforms, prior knowledge of this mode of publication is important. Serrano-Vicente, Melero, and Abadal (2016) argue that the usage of OA is highly dependent on academics being aware of this mode of scholarly communication. This has subsequently raised the interest of many scholars of OA adoption or embracement studies to address the awareness aspect before further examining academics' attitudes and adoption of OA publishing. Munikwa (2018) notes

that studies that assessed the adoption of OA publishing have acknowledged lack of awareness as contributing to non-adoption of OA by intended users.

## Attitudes towards OA Publishing

Attitudes towards OA are often informed by the encounters of academics with the innovation. Rowley et al. (2017) express that despite significant progress with policies and interesting debates on the future and impact of OA publishing, there is a dearth of studies that examine the behaviour and attitudes of academics towards OA publishing in scholarly journals. Sheikh (2019, 612) found that "the attitudes of faculty members towards OA in Pakistan were very positive in all contexts." Attitudes towards OA publishing can also vary from one institution to the other and from one academic department to the other, depending on the culture and support within that institution. Most negative criticisms towards OA publishing by academics arise as a result of authors being required to pay APCs, predatory publishers, and lack of credibility (McCann and Polacsek 2018).

## Adoption of OA Publishing

The adoption of OA can be determined by factors such as existing scholarly publication culture, scholars' perceptions of electronic publishing and the influence to take up new electronic publishing models (Lwoga and Questier 2014). Hawkins, Kimball, and Ives (2013, 33) attest that in a bid to promote and adopt OA scholarly communication, most institutions have made it mandatory for their theses and dissertations to be digitally available. Gross and Ryan (2015, 65) note that the rate of adoption of OA models in the humanities and social sciences has historically been lower than in science, technology and medicine disciplines. This raises the question of exposure and research domination within certain disciplines, institutions and countries. Sanni et al. (2013, 250) attest that although the rapid adoption of new technologies is due to the fulfilment of users' needs and when the technology is perceived as superior to other alternatives, a lack of enthusiasm towards some potentially beneficial innovations also exists even in social systems that are thought to be characteristically fertile for diffusion.

## Challenges Encountered in Adopting OA Publishing

Sanni et al. (2013) state that moving online has transformed the face of journal publishing and presents opportunities for journal publishers, but these are not without some challenges. These challenges have influenced decision-making and time taken for the adoption of electronic journal publishing in many developing countries. As such, academics are conflicted in their opinions on the benefits of OA. The major challenges and barriers of publishing in OA journals were established to be author fees and lack of stable internet connectivity (Bosah and Baro 2017). Criticisms regarding quality and reputation of OA publications also continue as major challenges to accepting OA, as compared to traditional and established journals (Rowley et al. 2017). Publication quality appears to be based on various factors, including the peer-review process and the reported impact factor of a journal (Togia and Korobili 2014).

## Methodology

This study adopted a quantitative research approach, which is useful in conducting research with large and heterogeneous populations and allows greater precision in reporting findings (Pickard 2013). One can also use computer software packages when analysing data to allow more objectivity (Fox and Bayat 2012, 78). The study adopted a questionnaire as a data collection tool, which comprised five sections. Section A sought information on demographic characteristics such as age, work experience and number of research papers published, to determine variables that may influence attitudes and the adoption of OA. Section B looked at awareness of OA publishing by academics, as well as how they became aware of this initiative. The five-point Likert scaling was used to ask respondents to rate items on a level of agreement. For example: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly agree. Among some of the sources of awareness provided to participants were the internet, the faculty librarian, workshops, colleagues, etc. Section C asked respondents about their attitudes towards OA publishing, whereby they were requested to show if they are "in favour" or "not in favour" of OA publishing. Section D looked at the actual adoption of OA by academics by asking them about the frequency of using OA publishing, the platforms of OA used and the types of materials which they have published through OA. Section E asked participants to list challenges that they encounter with the OA mode of publishing.

The targeted population of this study consisted of 250 academics in all faculties at UL, that is, the Faculty of Science and Agriculture, the Faculty of Health Sciences, the Faculty of Management and Law, and the Faculty of Humanities. Table 1 depicts the number of respondents per faculty. To arrive at this number, the study adopted systematic random sampling in which participants were selected by picking them on each third interval from the list of 752 academics in all faculties at UL. However, noting that some academic staff members may not participate due to their busy schedules, the researcher randomly sent out a web questionnaire link to all 752 academics at the UL. This resulted in 250 academics responding to the questionnaire, that is, a response rate of 33%. Data was analysed using an Excel spreadsheet.

**Table 1:** Response rate according to faculties (*n*=250)

| **Faculty** | **Frequency of respondents** | **Percentage (%)** |
|---|---|---|
| Faculty of Science and Agriculture | 98 | 39.2% |
| Faculty of Humanities | 62 | 24.8% |
| Faculty of Management and Law | 73 | 79.2% |
| Faculty of Health Sciences | 17 | 06.8% |
| **Total** | 250 | 100% |

## Findings and Discussions

In this section, various formats of data presentation such as figures, tables and narrations were used to provide a clear understanding of the research findings. The section also interprets and discusses the findings emerging from previous studies.

### Demographic Profile of Respondents

Demographic data refers to information that is related to participants' personal information such as age, gender, educational level, race and other related characteristics, and these are depicted in Table 2.

**Table 2:** Demographic profile of respondents

| Demographic factor | Variable | Frequency | Percentage (5) |
|---|---|---|---|
| Age | Between 26 and 30 | 44 | 17.6% |
| | Between 31 and 40 | 108 | 43.2% |
| | Between 41 and 50 | 35 | 44% |
| | Between 51 and 60 | 60 | 24% |
| | 66 years and above | 3 | 1.2 % |
| | **TOTAL** | **250** | **100%** |
| Work experience | Between 1 and 5 years | 82 | 32.8% |
| | Between 6 and 10 years | 95 | 38% |
| | Between 11 and 20 years | 24 | 9.6% |
| | Between 21 and 30 years | 14 | 5.6% |
| | 31 years and above | 08 | 3.2% |
| | No answer | 27 | 10.8% |
| | **TOTAL** | **250** | **100%** |
| Number of papers published | No published research output | 67 | 28.8% |
| | More than 3 papers | 83 | 33.2% |
| | Between 4 and 10 papers | 51 | 20.4% |
| | Between 11 and 15 papers | 8 | 3.3% |
| | Between 16 and 20 papers | 11 | 4.4% |
| | More than 20 papers | 30 | 12% |
| | **TOTAL** | **250** | **100%** |

*Age of Respondents*

With respect to age, the findings of this study revolve around middle-aged academics whose age group falls between 31 and 40, and those whose age group falls between 51

and 65 years old. Hoole (2019) confirms that the majority of academics are middle age or approaching retirement age in most higher education institutions across South Africa.

*Experience*

Table 2 further indicates that 95 (38%) respondents have 6–10 years of experience, followed by 82 (32.8%) who have 1–5 years of experience, and then 14 (5.6%) with 11–20 years, while 24 (9.6%) have 21–30 years of experience; only eight (3.2%) respondents have 30 years and more experience. Twenty-seven respondents (10.8%) did not provide an answer. Years of experience in the academic environment may have an influence on the adoption of OA publishing. Experience with journals already published is cited as one of the factors influencing decisions on journal selection (Wakeling et al. 2019). Therefore, experienced academics are more likely to adopt OA publishing than less experienced ones. In a study conducted by Chilimo et al. (2017), most academics in Kenya showed that they would consider publishing in OA journals based on their experience, as against few who said they would not publish in those journals because of publishers who abuse OA publishing.

*Number of Research Publications*

The numbers in Table 2 further indicate that out of 250 respondents, 82 (32.2%) respondents have not published more than three research articles, followed by 67 (28.8%) respondents who have not published any research article. However, 51 (20.4%) respondents have published between 4 and 10 research articles, followed by 30 (12%) respondents who have published more than 20 research articles. The lowest number of respondents, that is, 11 (4.4%) and 8 (3.3%), have published between 16 and 20, and 11 and 15 research papers, respectively. The findings show that out of 250 respondents, at least 183 (72%) respondents have produced papers. UL is ranked amongst universities that are gradually improving in terms of research output in South Africa. The journal publication output units in 2019 show that the university is at number 13 out of 26 universities in South Africa (Department of Higher Education and Training [DHET] 2019, 20). Inglesi-Lotz and Pouris (2018) reckon that South Africa has not yet reached the relevant level of the estimated threshold even though the country's research publications (in all disciplines) have increased substantially in recent decades. Singh (2015) looked at challenges and successes for building the research capacity at the UL. The findings revealed that there has been an increase in the capacity building initiatives of the university in the last four years. This is reflected in an increase in research output. However, the question remains whether or not staff members at the UL publish their research publications through the OA publishing mode, which will be revealed in the subsequent sections of this article.

**Awareness of OA Publishing**

Respondents were asked a question regarding their level of awareness of OA publishing. The question used Likert scaling to assess the extent of awareness towards the innovation. Figure 1 indicates that the majority, that is, 129 (51.6%) respondents have

some form of knowledge or degree of awareness of OA "to some extent," followed by 45 (18%) respondents who are knowledgeable "to a large extent"; 29 (11.6%) and then 8 (3.2%) respondents state they have "to no extent" any idea as to what OA is, whilst 29 (11.6%) are "to a very large extent" aware of OA.

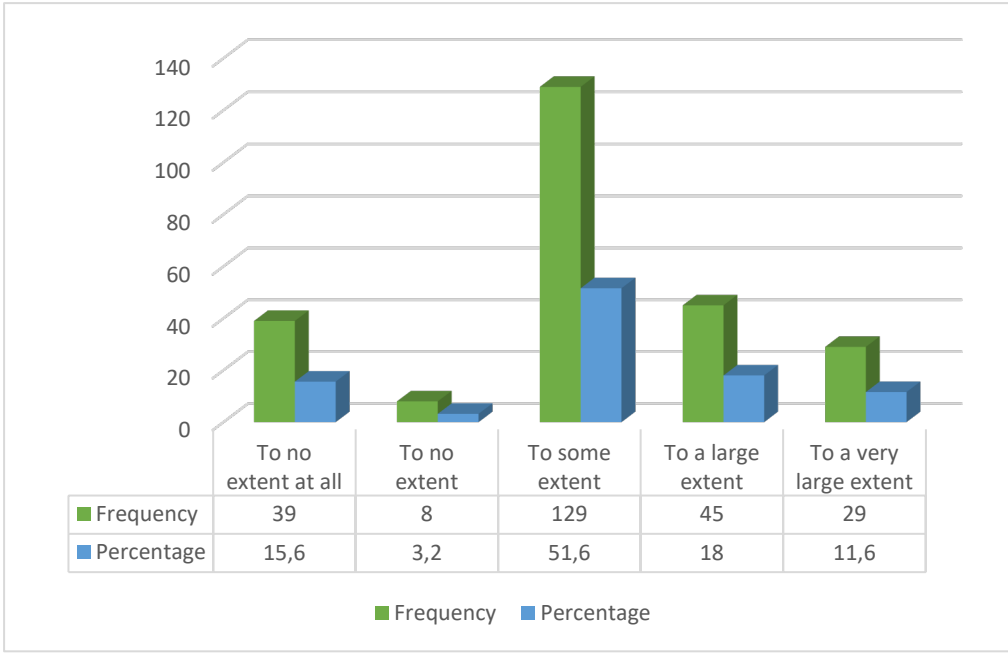
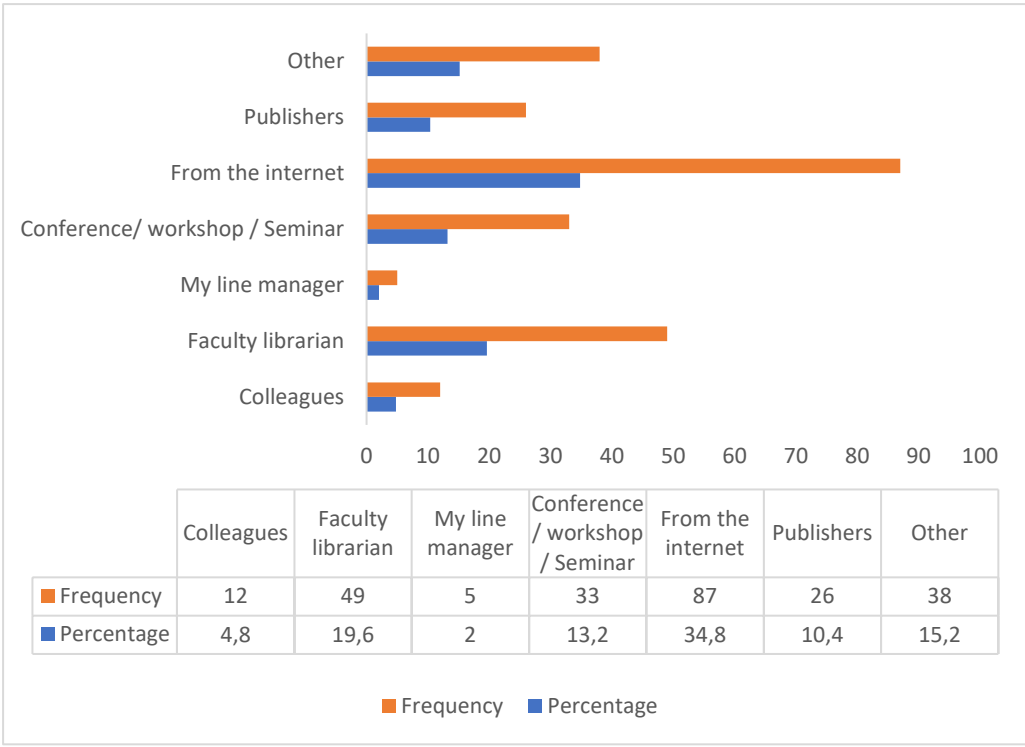



**Figure 1:** Level of awareness of OA

Zhu (2017, 557) found that academics' use of OA publishing was also related to their awareness of OA policy and OA repositories. Similarly, in the Philippines, a study by Creaser (2010) found that faculty members are very much aware of the characteristics of OA publications. On the contrary, Creaser (2010) found that academic staff had little knowledge of their IRs. Perhaps this is because OA was still at its introductory stage at the time the research was undertaken. In Nigeria, a study by Obuh and Bozimo (2012) "revealed a high level of usage of OA publications by both senior and junior LIS lecturers and that the awareness of OA concepts accounts for the tendency of LIS lecturers in Southern Nigeria to use OA publications."

A follow-up question was posed to respondents who are aware of OA about how they became aware of the initiative. The question was asked in order to establish the channel through which the OA initiative is spread to the academic community as espoused in the DoI theory. The results in Figure 2 show that 87 (34.8%) respondents relied on the internet as their source of awareness for OA. This is followed by 49 (19.6%) respondents who were informed by their faculty librarian. Thirty-eight (38) respondents (15%) indicated they attribute their knowledge of OA to other sources not listed, while 33 (13%) respondents acknowledged conferences or seminars as their sources of

knowledge about OA publishing. Twenty-six (26) respondents, that is, 10.4%, acknowledged publishers for their awareness of OA, and 17 (7%) listed their colleagues and line managers (5.2%) as their sources of awareness of OA.




| | Colleagues | Faculty librarian | My line manager | Conference / workshop / Seminar | From the internet | Publishers | Other |
|---|---|---|---|---|---|---|---|
| Frequency | 12 | 49 | 5 | 33 | 87 | 26 | 38 |
| Percentage | 4,8 | 19,6 | 2 | 13,2 | 34,8 | 10,4 | 15,2 |

**Figure 2**: Sources of awareness of OA

A study by Nunda and Elia (2019, 150) concluded that information literacy (IL) training is crucial in promoting adoption and usage of IRs in universities after their study on the adoption and use of IRs among postgraduate students in Muhimbili University of Health and Allied Sciences and Sokoine University of Agriculture. Furthermore, the study found that the library staff and lecturers are sources of awareness and the pulling factors in adoption and use of IRs.

### Attitudes towards OA Publishing

Attitudes, either positive or negative, also influence adoption of OA publishing. Participants were therefore also asked to choose between the extremes, that is, if they are "strongly in favour" or "not strongly in favour" of OA publishing. The participants were also requested to choose between "neutral," "in favour" of, or "against" OA publishing.

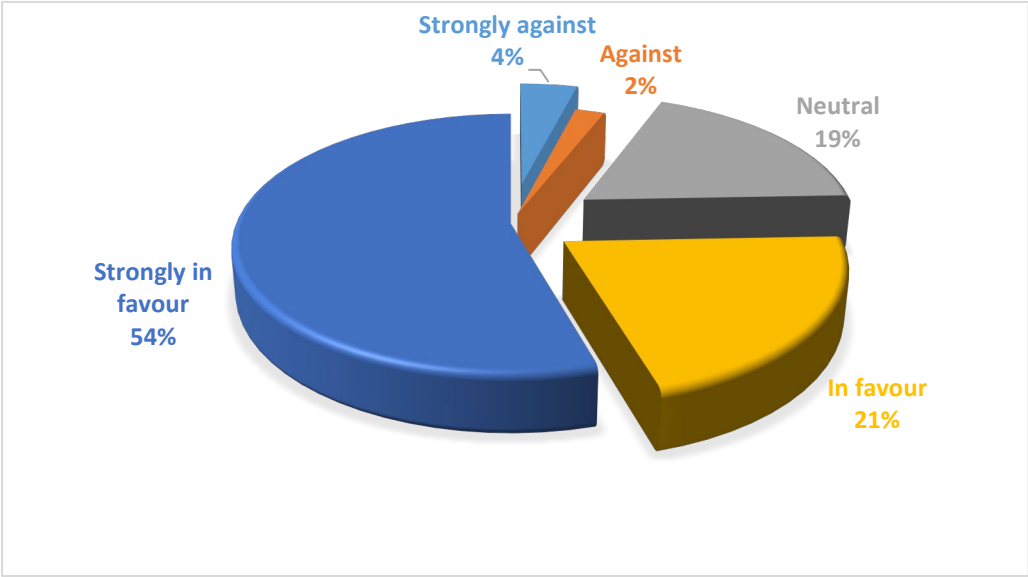
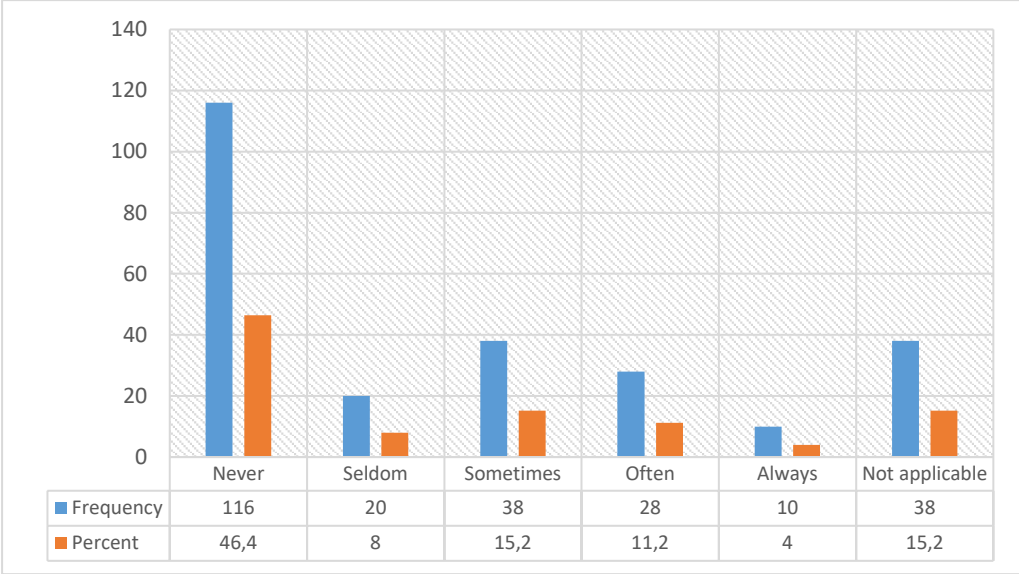



**Figure 3:** Stance towards OA

Figure 3 provides a breakdown of academics' attitudes towards OA. More than half, that is, 163 (54 %) respondents were "strongly in favour" of OA publishing. Fifty-three (21%) respondents were also "in favour," which adds up to 75% of respondents in support of OA, while 26 (19%) were "neutral" and 8 (6%) were against OA. This shows that most academics have a positive attitude towards OA publishing. A study by Mutsvunguma and Hoskins (2020) also found that academics' and researchers' attitude towards IR use was positive, although it was hampered by limited knowledge of OA and the benefits of uploading scholarly content on the IR, limited skill for self-archiving, and lack of time to upload content on the IR. Use of other OA publishing platforms by some academics and researchers, such as subject repositories, personal websites and social media platforms such as ResearchGate, Academia and Mendeley took their attention away from the university's IRs. ResearchGate, Academia and Mendeley are new emerging social networking sites for academics and scientists to share their papers, assist each other with research and scholarly queries and to find collaborators (Jain and Makwana 2022). Memon (2016) acknowledges that these tools are regarded as the most attractive academic social networking sites in the scientific community.

## Adoption of OA Publishing

With regard to the adoption of OA, participants were first asked about the frequency with which they publish in OA journals. They were requested to choose from responses that were given to them ranging from "always" to "never." Those who did not publish any paper were provided with the response "not applicable."



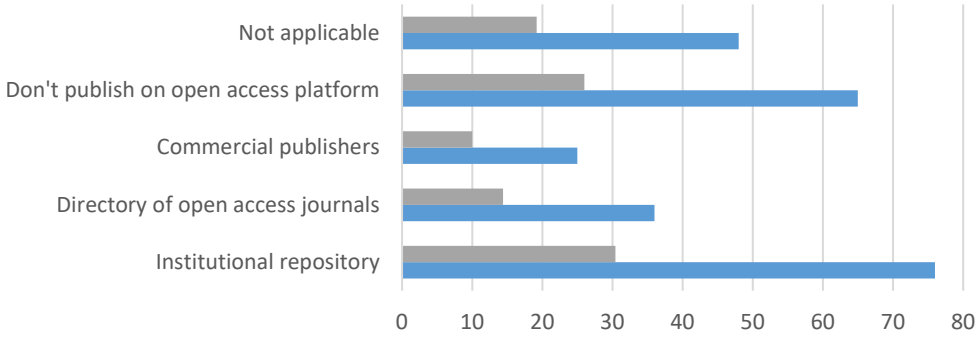

| | Never | Seldom | Sometimes | Often | Always | Not applicable |
|---|---|---|---|---|---|---|
| Frequency | 116 | 20 | 38 | 28 | 10 | 38 |
| Percent | 46,4 | 8 | 15,2 | 11,2 | 4 | 15,2 |

**Figure 4:** Frequency of publishing on OA publishing platforms

Figure 3 indicates that 116 (46.4%) have "never" published on OA platforms, followed by those who "sometimes" publish on OA publishing platforms with 38 (15.2%) respondents. Thirty-eight (38) (15%) respondents chose the "not applicable" option, and only 28 (11%) respondents "often" publish OA, while 20 (8%) respondents "seldom" do so. The figures further show that only 10 (4%) respondents "always" publish OA, which is a small margin compared to those who "never" do so. The main finding of a study by Allahar and Sookram (2020, 126) at the University of the West Indies is that "OA was not fully embraced as a publishing outlet because of academic resistance derived from questions of acceptability, and the existence of a system that assigns greater recognition to the established subscription journals." Bashorun et al. (2016) also revealed low levels of adoption by academic staff in Nigerian universities.

## Types of OA Platforms Used

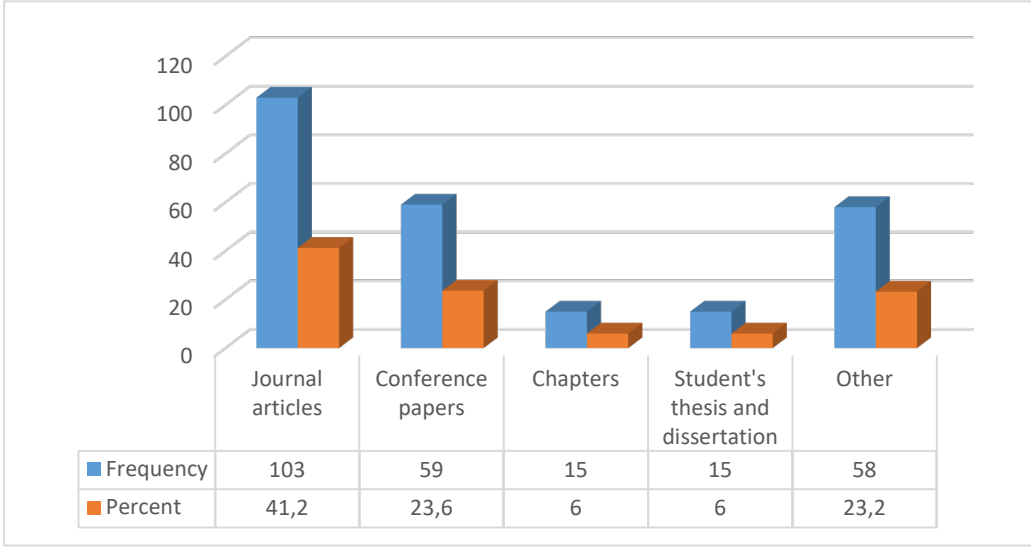
A follow-up question probed the participants about the types of OA publishing platforms they used, such as commercial publishers, Directory of Open Access Journals (DOAJ) and IRs. Those who never published on OA platforms were also provided with options to choose from. The results are depicted in Figure 5.




| | Institutional repository | Directory of open access journals | Commercial publishers | Don't publish on open access platform | Not applicable |
|---|---|---|---|---|---|
| Percent | 30,4 | 14,4 | 10 | 26 | 19,2 |
| Frequency | 76 | 36 | 25 | 65 | 48 |

**Figure 5:** Types of OA platforms used

IRs hold a remarkable prospect of breaking down barriers of access to scholarly communication, yet many remain underutilised and infrequently accessed (Luca and Narayan 2016). Mutsvunguma and Hoskins (2020) examined the extent of use of the IR by academics at the University of KwaZulu-Natal (UKZN), South Africa. The findings revealed a number of factors that contribute to and support the use of the IR, such as the signing of the Berlin Declaration, employment of a full-time IR librarian, updating of the DSpace, development of an online submission guide, and ongoing training and awareness programmes.




| | Journal articles | Conference papers | Chapters | Student's thesis and dissertation | Other |
|---|---|---|---|---|---|
| Frequency | 103 | 59 | 15 | 15 | 58 |
| Percent | 41,2 | 23,6 | 6 | 6 | 23,2 |

**Figure 6:** Types of publication uploaded on OA platforms

## Types of Publications Uploaded on OA platforms

The participants were further requested to choose from a number of scholarly publications in order to find out about the types of publications that they usually publish through OA publishing. The types of publications that the participants could choose from included research articles, conference papers, chapters in books, theses, dissertations and other types of scholarly publications. Figure 6 shows that 103 (41.2%) respondents publish journal articles through OA, whilst almost an equal number of respondents, at 59 (23.6%) and 58 (23.2%), made available conference papers and other documents, respectively. An equal number of respondents of 15 (6%) apiece made available book chapters and students' theses and dissertations. Other means of OA publishing which were not listed were selected by 58 (23.2%) respondents. These findings reveal that journal articles appear to be the most important vehicles or scholarly outputs through which academics publish their research results (Wakeling et al. 2019). Sharing of scholarly journal articles appears to be the main force behind the initiation of OA (Björk 2021). Dandar et al. (2020) recognise that over and above scholarly journal articles, faculty members also use conference papers and book chapters to share their research findings with the academic community and the public.

## Challenges in Adopting OA Publishing

The next question sought to solicit information from respondents about challenges that they encountered in adopting OA publishing. The question allowed the respondents to list the challenges they encounter in adopting OA. Among some of the challenges that the respondents highlighted were internet connectivity and lack of information and communication technologies (ICT) connectivity, articles not being peer reviewed, fake publishers, APCs, lack of knowledge and lack of OA policies. Unstable internet connectivity and power interruptions are some of the challenges reported to have been affecting academics in accessing OA content. Of the 250 respondents, nine (3.6%) indicated that internet connectivity is a hindrance. Fox and Hanlon (2015, 705) attest that one of the barriers to OA publishing is technological requirements, with internet connectivity at the helm of the barriers. These challenges can also be coupled with lack of ICT facilities, as stated by some respondents. Ridwan (2015) remarks that inadequate ICT infrastructure and the high cost of internet bandwidth are major problems in Nigeria. Low bandwidth and erratic power supply were also revealed by Okite-Amughoro, Makgahlela and Bopape (2014) as some of the challenges related to ICT infrastructure in Delta State University, Nigeria. Fifteen respondents believed that OA articles are not peer reviewed and thus are of an inferior quality. The importance of the peer-review process for OA materials is emphasised by the BOAI. Of the 250 respondents, only four (1.6%) believed that fake publishers are a challenge in using OA publishing. Enago Academy (2018) opines that fake publishers are the most significant challenge in improving the quality of research in OA articles. With the increasing number of OA publications, some of them having dubious backgrounds, it is more difficult for academics to identify appropriate content and to determine whether these articles have gone through a rigorous and reliable review process or the authenticity of

the journal or publisher. Wareham (2018) attests that the growing prevalence of predatory journals and publishers, and the introduction of mega-journals and their potential impacts on the credibility of scientific publishing, will affect the reputation of academics as publishers.

Other respondents indicated that the charges incurred in publishing are preventing them from publishing in this mode of scholarly publication. Lwoga and Questier (2014) confirmed that anxiety to encroach upon publisher's copyright policies demotivates faculty members to adopt OA. During the 2018 OA Week, Radijeng (2018) made mention of the fact that although OA is well received in African countries, as evidenced by the level of usage of IRs, it has not helped much with copyright challenges and cost reduction, since most of the journals are under the control of commercial publishers. APCs are not understood by most, but yet they are seen as a limitation for adoption, as most respondents believe that they need to be paid for their contribution and not to pay to make a contribution. In this study, 15.6% of the respondents stated that they are not aware of OA publishing. This is in relation to 15.2% who are not familiar with it. Not knowing exactly what OA is about and how it will evolve in the future is proving to be a limiting factor for adoption.

Lack of OA policies was also found to be a hindrance for academics to publish on OA platforms. Policies are meant to direct and regulate the work and knowledge shared, and thus institutions need to develop policies that can be adhered to and assist people in understanding how things work. Narayan and Luca (2017, 2) posit that the government research funding policies for the university are not tied into OA deposits in the repository, but are instead tied into peer-reviewed journals and articles published in journals with high impact factors. Consequently, the university has not adjusted its policies to ensure support of repositories, but explicitly rewards traditionally published work, whether or not it is placed in the repository.

## Conclusion and Recommendations

Looking back at the theoretical framework which guided this study, namely DoI, major conclusions can be drawn from the findings of the study. In general, OA publishing appears to be an innovation communicated to the academics through the internet and faculty or subject librarians. Although the rate of adoption among the academics appears to be slow, its relative advantage and compatibility are recognised, because the academics have shown that they are in favour of the innovation. The results regarding adoption and usage show that there is still a lot that needs to be done to make people understand the importance and benefits of OA publishing. The academics observed that OA has resulted in the growth of journals that are not peer reviewed and predatory publishers. These developments, as well as the APCs that go along with OA, affect the rate and adoption of OA publishing. In terms of time of adoption, the study reveals that most of the academics were in the category of early majority who still needed more information about the advantages of adopting OA publishing. Based on the findings of the study, it is recommended that the university library should intensify its awareness

campaigns on OA publishing. Workshops and seminars should be organised where librarians should explain to the academics what OA publishing entails and the benefits thereof. Academics who are reaping the benefits of publishing on OA platforms should be given opportunities to showcase what they are gaining, especially visibility of their works and more citations. Future studies should focus on identifying the effects of economic factors and social structure on the motivation for OA publishing.

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