
Adoption of Open Access Publishing by Academic Researchers in Kenya

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This study investigates Kenyan scholars' adoption of open access (OA). The authors used a questionnaire to collect data from academic researchers at selected Kenyan public universities. The findings of this study indicate that while Kenyan researchers have embraced the concept of OA, challenges such as a lack of mechanisms to guide academic researchers on where to publish, a dearth of funding mechanisms to cover article processing charges, and a lack of accreditation mechanisms for regional and national journals are exposing Kenyan academic researchers to unscrupulous journal publishers and predatory publishing outlets. OA advocates in Kenyan universities need to devise innovative ways of raising awareness about OA, and these universities should provide the environment, infrastructure, and capacity building needed to support OA.

Keywords: open access, article processing charge, fraudulent publisher, sub-Saharan Africa, Global South

INTRODUCTION

A development that has revolutionized scholarly communication is the advent of open access (OA). OA promises to free up access to scholarly literature that would otherwise be hidden behind paywalls and subscription charges, thus making it accessible to a majority of scholars, especially those from developing countries, specifically in Africa. Limited access to scientific literature has been identified as one of the major problems facing researchers on the African continent.¹ In addition to the access problem, output in scholarly publication is generally low in Africa.² The UNESCO Institute for Statistics, in the *Bulletin on Science and Technology Statistics*, indicated that the whole of Africa accounted for only 1.4 per cent of the world's scholarly publications in 2000, a

percentage that had not changed from 1990.³ A report from the World Bank and Elsevier in 2014 pointed out that sub-Saharan Africa still accounted for less than 1 per cent of the world's research output, a far cry from its 12 per cent share of the world's population.⁴

OA is often touted as a strategy for improving both the productivity and accessibility of scholarly research in Africa.⁵ A 2016 study by Okemwa pointed out that OA, as a new mode of scholarly communication, may address most, if not eventually all, the problems that confront scholarly publishing in sub-Saharan Africa.⁶ Furthermore, Kunle suggested that Africa stands at the brink of dawn in its transition to a knowledge economy, and research recommends OA as one of the ways to bring this transition about. Kunle, however, also noted that, just like any other tool, OA has to be embraced and cultivated in order to reap its benefits.⁷ The recently adopted Dakar Declaration on Open Access for Africa and the Global South states that OA can leverage the combined power of scholarly information and technology to solve the problem of limited accessibility to and production of knowledge in Africa.⁸ Among other things, the declaration observes the need for greater recognition of the role and significance of scholarly communication in the development agenda for Africa and the Global South. The declaration further recommends that institutions and governments in Africa and the Global South urgently develop OA policies and initiatives to promote scholarship as well as knowledge dissemination.

There are currently various initiatives to promote OA in Kenya. For instance, in recent years Kenya has experienced a rapid development of institutional repositories. The number of institutional repositories in Kenya, listed by the Directory of Open Access Repositories (OpenDOAR), rose from two in 2009 to twenty-six currently.⁹ According to OpenDOAR's count, Kenya is the second-largest contributor of institutional repositories in sub-Saharan Africa after South Africa. Kenya has made more progress compared with its East African neighbours Tanzania and Uganda, which have eleven and two repositories, respectively.

Despite optimism for OA's potential to revolutionize scholarly publishing in Africa and various initiatives currently in place to promote it, there is very limited empirical evidence of the response to the OA concept by academic researchers in Africa and in Kenya particularly. The perception of academic researchers in Africa regarding OA journals and the author-pay model is largely unknown. A few empirical studies conducted in

African countries have shown that the level of awareness and acceptance of OA by researchers is generally low.¹⁰

In this study we therefore set out to learn more about Kenyan scholars' adoption of OA. By means of a survey, we sought to measure Kenyan researchers' awareness and general perceptions of OA. The survey also asked respondents about past publication in OA journals, the status of OA publications for tenure and promotion at their institution, and their participation in the author-pay model of OA. This study is important, especially now when most Kenyan universities are in the process of adopting institutional OA policies and strategies. The results of this study will provide important feedback for OA policy making at Kenyan universities and will increase knowledge about OA among Kenyan academics.

METHOD

To attain the objectives of this study, we employed a survey research design. Surveying is a research method by which information is typically gathered by asking a subset of people questions on a specific topic and generalizing the results to a larger population.¹¹ We chose a survey design because it can be used to collect information on how people think and say they act.

Our study population comprised academics employed by selected public universities in Kenya that, at the time of our data collection (June 2014), were engaging in institutional OA activities. These activities included having established an institutional repository, adopted an OA policy, participated in OA Week, or organized OA workshops. We checked to see whether institutions had an institutional repository listed in OpenDOAR or an OA policy listed on the Registry of Open Access Repository Mandates and Policies (ROARMAP) website.¹² Websites of the universities were also checked for evidence of OA activities.

Based on the above criteria, we selected six universities: University of Nairobi (UoN), Kenyatta University (KU), Egerton University (EU), Dedan Kimathi University of Science and Technology (DeKUT), Jomo Kenyatta University of Agriculture and Technology (JKUAT), and Pwani University (PU). JKUAT did not respond to our invitation to participate and so was excluded. Of the five participating universities, three (UoN, KU, and EU) are among the oldest, most established universities in Kenya, with a large number of students and academic researchers; the other two, DeKUT and PU, are fairly new universities established in

2007 as constituent colleges of JKUAT and KU, respectively, and subsequently awarded charters in 2012 and 2013, respectively. A constituent college in this context means a semi-autonomous component of a chartered university whose academic affairs are governed by the senate of the chartered university.¹³

A representative sample of academics employed at the selected universities was obtained by stratification. This involved dividing the population into mutually exclusive sets, or strata, to ensure that all cadres were adequately represented. The different ranks of university teaching staff (e.g., assistant lecturers, lecturers, senior lecturers, and professors) formed the strata. We devised a questionnaire to collect data on the academics' perceptions of OA, past publishing in OA outlets, the consideration of OA publications for tenure and promotion at their institution, and their use of the author-pay OA model. The questionnaire was self-administered and delivered to respondents in hard copy. It was designed to collect quantitative data mainly; however, some qualitative data were also collected from open-ended questions. A total of 317 participants responded to our survey.

RESULTS

Characteristics of Respondents

Of our 317 respondents, 103 (32.5 per cent) were from KU, 64 (20.2 per cent) were from UoN, 61 (19.2 per cent) were from DeKUT, 56 (17.7 per cent) were from PU, and 33 (10.4 per cent) were from EU. Prior studies have reported that characteristics of academics such as academic rank, age, and technological skills may determine their OA usage.¹⁴ In Table 1 we report the characteristics of our respondents, including their institutional affiliation, age, gender, academic rank, and area of specialization. Two hundred and seven (65.6 per cent) of our respondents were male, and 110 (34.5 per cent) were female. A majority of the respondents were aged 30–39 years (30.6 per cent) and 40–49 years (30.3 per cent), so most were early- or mid-career researchers. The relationship between respondents' age and their institutional affiliation was statistically significant at 1 per cent, indicating that the younger universities, PU and DeKUT, have a younger staff on average compared with the longer-established UoN, KU, and EU.

TABLE 1. Demographics and credentials of respondents ($n = 317$)

	Characteristic	Number	Percentage
University	PU	56	17.7
	DeKUT	61	19.2
	EU	33	10.4
	UoN	64	20.2
	KU	103	32.5
Gender	Male	207	65.5
	Female	110	35.5
Age in years	<30	43	13.5
	30–39	97	30.6
	40–49	96	30.3
	50–60	59	18.6
	60 or older	22	6.9
Academic rank	Professor	24	7.5
	Senior lecturer	46	14.5
	Lecturer	116	36.6
	Assistant lecturer	131	41.3
Specialization	Pure and applied sciences	90	28.4
	Health sciences	30	9.5
	Agriculture and veterinary sciences	19	5.9
	Technology, engineering, and architectural studies	31	9.7
	Humanities and social sciences	57	17.9
	Education	50	15.7
	Business	40	12.6

In terms of the academic rank of participants, more respondents were at the assistant lecturer rank (131, or 41.3 per cent). This rank represents staff members with a Master's degree. This was followed by staff members at the lecturer rank (116, or 36.6 per cent). Academic researchers at this rank normally have a PhD and at least three years' experience in research and teaching at the university. In addition, our sample included forty-six (14.5 per cent) senior lecturers and twenty-four (7.5 per cent) professors. In terms of academic area of specialization, our sample broke down into the following categories: ninety (28.4 per cent) in pure and applied

TABLE 2. Respondents' perceptions of OA ($n = 317$)

Statement	Scale	Number	Percentage
OA promotes engagement with global science.	Strongly agree	143	45.1
	Agree	137	43.2
	Not sure	34	10.7
	Disagree	3	0.9
	Total	317	100
OA promotes advancement of scientific knowledge.	Strongly agree	141	44.5
	Agree	135	42.6
	Not sure	38	11.9
	Disagree	3	0.9
	Total	317	100
OA articles are read and cited more.	Strongly agree	140	44.2
	Agree	127	40.1
	Not sure	47	14.8
	Disagree	3	0.9
	Total	317	100
OA exposes scholarly work to possible plagiarism.	Strongly agree	71	22.4
	Agree	119	37.5
	Not sure	59	18.6
	Disagree	60	18.9
	Strongly disagree	7	2.2
	Total	317	100

sciences; fifty-seven (17.9 per cent) in humanities and social sciences; fifty (15.7 per cent) in education; forty (12.6 per cent) in business; thirty-one (9.7 per cent) in technology, engineering, and architectural studies; thirty (9.5 per cent) in health sciences; and nineteen (5.9 per cent) in agriculture and veterinary sciences.

Respondents' Perceptions of OA

Respondents were asked to indicate their perceptions of various facets of OA (strongly agree, agree, not sure, disagree, or strongly disagree). Respondents' answers are summarized in Table 2. Over 80 per cent of our respondents answered affirmatively in response to three of our four

TABLE 3. Respondents' answers about whether OA publications count for tenure and promotion

		Do OA articles count for tenure/promotion?		Total
		Yes	No	
University	PU	47	9	56
	DeKUT	45	16	61
	EU	26	7	33
	UoN	50	14	64
	KU	78	25	103
Total		246	71	317

scaled statements, either agreeing or strongly agreeing that OA promotes engagement with global science, that OA advances scientific knowledge, and that OA articles are read and cited more. These results show that a majority of researchers in Kenya agree with the general principles and advantages afforded by OA.

Most of our respondents were between the ages of 30 and 39 years (30.6 per cent) and 40 and 49 years (30.3 per cent), groups that can be considered early- to mid-career researchers. We therefore wanted to see if there was a correlation between respondents' OA perceptions and their age group. The result of this analysis found no significant correlation between respondents' age and their perceptions of OA.

Use of OA Journal Articles for Tenure and Promotion

All respondents were asked to indicate if OA publications count toward academic rewards such as tenure or promotion at their institution; 246 (78 per cent) indicated that OA publications do count toward tenure and promotion, while only 71 (22.4 per cent) indicated that OA articles do not count. The results are shown in Table 3. Chi-square analysis of institution as a variable showed no significant variation among universities when it comes to counting OA publications for promotion. Differences in the answers by faculty at the same institution may indicate a lack of awareness of their institution's policies. However, the general indication

by a majority of the respondents is that OA publications are not discriminated against for tenure and promotion in Kenyan universities.

In some cases researchers are even encouraged to publish in peer-reviewed OA journals. For instance, UoN's 2012 OA policy¹⁵ states that authors are encouraged to publish their scholarly work in peer-reviewed OA journals. The policy further states that those who publish in OA journals shall not be disadvantaged in promotion and tenure considerations. Despite the fact that UoN has this policy, 22 per cent of respondents from this institution indicated that OA publications are not considered for tenure and promotion. This shows a lack of awareness of institutional policies among some academic researchers.

Publishing in OA Journals by Researchers in Kenya

Respondents were asked if they had published at least one journal article in an OA journal. A total of 146 (46 per cent) indicated that they had published in an OA journal, while 171 (54 per cent) indicated that they had not. Cross-tabulation of the data showed that, of all those who had published in OA journals, 67.13 per cent were male and 32.87 per cent were female. Out of the male population that was sampled, 46.83 per cent had published in an OA journal. Of the female respondents, 43.93 per cent had published in an OA journal. Chi-square analysis showed no significant association between gender and publishing in an OA journal.

The distribution of faculty who had published in OA journals across age groups was as follows: fifteen (10.3 per cent) were below the age of 30, forty-six (31.5 per cent) were 30–39 years old, forty-two (28.7 per cent) were 40–49 years old, thirty-three (22.6 per cent) were 50–59 years old, and ten (6.8 per cent) were 60 years or older. Table 4 shows the distribution of faculty who had published in an OA journal across the various academic ranks. These results show that associate professors were the rank most likely to have published in an OA journal, at 64.2 per cent, whereas assistant lecturers were the least likely rank to have published in an OA journal, at 38.2 per cent.

Further analysis showed no significant association between age and having published in an OA journal, but we did find that academic rank was a significant factor in determining whether an academic researcher had published in an OA journal. There was a significant association between rank and having published in an OA journal. Lecturers in lower

TABLE 4. Academic rank of respondents as related to their having published in an OA journal

Academic rank		Have you published in an OA journal?		Total
		Yes	No	
Professors	%	54.2	45.8	
	Number	4	6	10
Associate professors	%	64.2	35.7	
	Number	9	5	14
Senior lecturers	%	63	36.9	
	Number	29	17	46
Lecturers	%	46.5	53.4	
	Number	54	62	116
Assistant lecturers	%	38.2	61.8	
	Number	50	81	131
Total	%	46	54	
	Number	146	171	317

ranks tended to publish less in OA journals compared with those in the ranks of senior lecturer, associate professor, and professor.

These results were confirmed by a logistic regression; academic researchers in senior positions were twice as likely to have published in an OA journal compared with their colleagues in junior positions, by an odds ratio (exp[B]) of two. The increased likelihood may not necessarily indicate more receptiveness to OA journals among academics in senior positions but may owe to the fact that academic researchers in senior positions have published more in general as a part of their job responsibility, whereas junior faculty do not have the same job expectation to publish. Respondents at the assistant lecturer rank were the most numerous group by rank in our study, and academics at this rank have Master's degree qualifications.

In another question, respondents were asked to indicate their reasons for publishing in OA journals. Only the respondents who said they had published in an OA outlet answered this question. The results for this question are shown in Table 5. The most common reason cited for OA

TABLE 5. Respondents' reasons for publishing in OA journals

Reason	Percentage
The OA journal(s) I have published in is/are published by my own institution	4.5
Influence from grant-awarding body	5.2
Desire to retain copyright of my work	7.2
Prestige	9.1
Influence from institution	9.1
Influenced by a co-author	20.1
Desire to have more citations for my article	37.0
Faster publication rate	45.5
Larger readership	53.9
The principle of free access for all readers was an important reason	66.9

publishing was that the principle of free access to all readers was important to the respondent (66.9 per cent).

We also asked the same respondents to indicate and provide reasons for whether they would consider publishing in OA journals in the future given their past experiences with OA publishing. This was an open-ended question. The results of this question were analysed using content analysis, organized into themes, and then quantified (Table 6). Nearly all respondents (144, or 98.6 per cent) indicated that they would consider publishing in an OA journal in the future, while only two (1.4 per cent) said they would not publish in OA journals in the future, citing concerns about publishers abusing the OA model—for example, 'I have found it being abused' and 'I am concerned about [the] quality of some of these journals.'

Of those who indicated they would publish again in an OA journal, fifty-nine (41 per cent) indicated a desire to reach a wider audience as the reason they would consider it—for example, 'because I am still interested in seeing my research work reach [a] wider audience,' 'they have a wider audience compared to hard copy journals,' 'they have larger readership than for subscription based journals,' and 'I still believe that it's the most widely accessible platform of sharing information.' Many also cited faster publication time as a reason they would consider publishing in OA journals in the future. Those reasons categorized as

TABLE 6. Respondents' reasons for publishing in OA journals in the future

Theme*	Number	Percentage
Desire to reach a wide audience	59	41
Faster publication time	25	17.3
Free accessibility to readers	18	12.5
Ease of access	16	11.1
Increase citation of my publication	12	8.3
I need to publish in OA for career progression	9	6.25
Others	5	3.8
Total	144	100

* Since the question was open ended, we organized responses into themes during analysis.

'others' included responses such as 'in order to avoid plagiarism' and 'I want to retain copyright for my [publication].'

Respondents' Use of the Author-Pay Model

All respondents were asked to indicate whether they had ever paid an article processing charge (APC) or similar fee to have their work published, and 165 respondents answered this question. About half (85, or 51.5 per cent) of the respondents confirmed that they had paid an APC for at least one of their articles, while the other half (80, or 48.5 per cent) indicated that they had never paid an APC fee to publish their work. (Cross-tabulation analysis found no significant association between paying an APC and the institution of affiliation, age, or academic rank of the respondents.) This finding shows that a sizable portion of authors are willing to pay APCs. This result contravenes findings from previous research indicating that researchers from developing countries may not be able or willing to pay for their articles to be published.¹⁶

The respondents who confirmed that they had paid an APC to publish were then asked to indicate how much they had paid for their last article. Eighty-five respondents answered this question. The amount of money they claimed to have paid ranged from \$8 to \$600. The majority paid an APC of \$200 or less. The average APC paid was \$172. The distribution of APC amounts, by \$100 increments, is shown in Table 7.

TABLE 7. Distribution of last APC amount paid by respondents

Fee range	Number	Percentage
Below \$100	22	26
\$100–\$200	32	38
\$200–\$300	17	20
\$300–\$400	6	7
Above \$400	8	9
Total	85	100

The minimum, maximum, and average APC figures quoted by our respondents are generally lower than figures reported in other studies that have analysed APCs. The low figures raise concerns about the ability of Kenyan researchers to pay average APCs and perhaps the quality of the journals used by researchers in Kenya.

The APCs reported in other studies have been consistently higher than what we found. Solomon and Björk, in their 2012 study on APCs using data from the Directory of Open Access Journals (DOAJ), reported that the minimum APC charged by OA journals listed in the DOAJ was \$8, the highest figure was \$3900, and the overall average was \$906.¹⁷ Dallmeier-Tiessen, in a study conducted in Berlin, reported that 50 per cent of the authors paid for their most recently published OA article. The lowest figure quoted was \$350 while the highest was \$4100. The majority paid between \$700 and \$1350.¹⁸ Cozzarelli and co-authors reported that nearly 50 per cent of authors expressed a willingness to pay an ‘open access surcharge’ of \$500 or more to make their papers available for free online immediately upon publication. In addition, the average price per article paid by the Wellcome Trust, one of the most prominent OA funders, was \$3000.¹⁹ Solomon and Björk reported that the APC charged by the OA journal *PLOS ONE* was \$1350.²⁰

Studies on APCs also indicate that the amount charged by journals varies depending on the discipline and the quality of journal as measured by Impact Factor. Björk and Solomon reported that biomedical journals tend to be more expensive to publish in than journals in the social sciences and humanities, fields in which authors tend to have more difficulty securing external funds to pay APCs.²¹ Studies have also found

TABLE 8. Respondents' source of funding for last APC paid

Source of funds	Number	Percentage
Author/shared by co-authors	53	62
Waived by publisher	13	15
Research grant	8	9
Department/university funds	9	11
Other institutional funds	2	2
Total	85	100

that journals published in developing countries normally charge the lowest APCs, whereas journals with a high Impact Factor from major publishers normally charge the highest APCs.²²

In our survey we also asked respondents to indicate the source of funds for their last payment of an APC. Their answers to this question are given in Table 8. The majority of respondents (53, or 62 per cent) indicated that they paid the APC out of their own pocket. Very few respondents paid their APC through research grants (8, or 9 per cent) or university funding (9, or 11 per cent).

In a 2014 study Solomon and Björk found that around 30 per cent of researchers in industrialized countries were using grants to cover their APCs, and in only 12 per cent of cases did the researchers themselves pay the charge.²³ As pointed out by Adomi and Mordi, the cost of OA must be given due consideration in developing countries because only a small number of publications in such countries derive from funded research; the rest are based on the individual efforts of scholars who struggle to satisfy the 'publish or perish' expectation at their institutions.²⁴

Due to the high level of personally funded research in developing countries, authors in these countries will also have to fund the publication of most papers out of their own pocket. Solomon and Björk reported that low-quality publishers funded by APCs, often termed 'predatory' publishers, are unlikely to be chosen as outlets by authors receiving government or foundation research grants, at least in academically leading countries such as the United Kingdom.²⁵ This situation makes researchers from developing countries a prime target for fraudulent OA publishers charging less expensive APCs and promising fast publication.

TABLE 9. Respondents' views on APCs

Theme*	Number	Percentage
They are too high	44	52
APCs are necessary for publications to be OA	33	39
Alternative funding mechanism should be put in place	4	5
APCs may be abused by publishers	2	2.3
I am concerned about quality of OA journals that charge APCs	2	2.3
Total	85	100

* Since the question was open ended, we organized responses into themes during analysis.

The penetration of low-quality and often unscrupulous journal publishers in developing countries can cause significant damage to the reputation of researchers from those countries and the scientific literature generated in those countries. However, as Doyle and co-authors argue, the concern about authors' ability to pay APCs will become less pressing if governments and institutions support OA publication on their researchers' behalf.²⁶

Finally, toward further analysis of respondents' use of the author-pay model, we asked the respondents who had paid an APC to give their views regarding publication fees. This was an open-ended question. The results of this question were analysed using content analysis and organized into themes. The major themes that emerged from the responses are presented in Table 9.

A majority of respondents (44, or 52 per cent) indicated that the APCs charged by journals are too high. Their written responses included the following: 'for some [journals] the OA publication fees are prohibitive and therefore limiting publication by scientists from developing countries,' and 'it's a bit high hence upcoming researchers especially those who are still studying cannot afford [it].'

Only two respondents (2.3 per cent) indicated concerns about the quality of journals that charge APCs, expressing the following opinions: 'it defeats the old scholarly publishing tradition. . . *Perish if you can't Pay*

to Publish... It might lower standards,' and 'they are good if only standards are kept quite high [with copyright].' The two respondents with concerns about the abuse of APCs by publishers responded thus: 'some publishers have commercialized the fees' and 'it is not fair if they will earn money from my articles.'

These findings show that, although the average APC figures quoted by our respondents were generally lower than figures reported in other studies, these charges were still considered too high for a majority of our respondents, probably due to a high level of personally funded research.

CONCLUSION AND RECOMMENDATIONS

The majority of the academic researchers who participated in this study were early- and mid-career researchers. Some sources indicate that young academics and early-career researchers, especially those from developing countries, face many challenges in embracing OA. These challenges include a lack of funds to pay the APCs of gold OA publishers, a lack of awareness about the scholarly publishing process, uncertainty about choosing the right journal in which to publish their work, concerns about the visibility and impact of their work, and concerns about their prospects for employment, grants, and tenure.²⁷ These concerns call for OA advocates in developing countries to put more emphasis on this group of academic researchers and perhaps use them as ambassadors in their campaigns to raise awareness of OA.

Although this study did not investigate researcher awareness of fraudulent OA publishers and publishing scams, there is some indication that such awareness is lacking in developing countries. For instance, a 2016 study by Shuva and Taisir showed that nearly 50 per cent of faculty members at the University of Dhaka, Bangladesh, were unaware of the author-pay model of OA journals and consequently were unaware of fraudulent OA journals.²⁸ There is a need for universities in Kenya to put in place mechanisms to weed out low-quality OA publications from their review systems.²⁹ Authors should also be able to identify and resist fraudulent publishing companies, who often target authors from developing countries.

The Commission for University Education in Kenya harmonized the promotion criteria currently used by all public universities in Kenya, and

these criteria clearly state that peer-reviewed publications will be considered in faculty assessment.³⁰ However, in most cases, universities do not have mechanisms in place to ensure that only genuine peer-reviewed publications are considered for tenure and promotion. As pointed out by Nwagu in 2015,³¹ in countries where research coordination is poor or non-existent and there is no authoritative list to guide researchers on where to publish, the likelihood that young scholars or others will resort to predatory outlets will be very high.

The 2016 Dakar Declaration on Open Access in Africa and the Global South notes with concern the issue of quality in OA adoption in Africa and the Global South and the negative influence of the increasing commercialization of scholarly publication and information. As stated by Jeffrey Beall, scientific literacy must include the ability to recognize publishing fraud.³² An example of mechanisms put in place to address the problem of predatory journals with no peer review is the policy recently instated by the Department of Higher Education and Training in South Africa, which requires proof of peer review with all accredited journal articles submitted to a department to be counted as part of the research output for subsidy, tenure, or promotion.³³ In addition, researchers in South Africa can only publish in journals accredited by the Department of Higher Education and Training if they want them to be considered for tenure and promotion. So far there is no evidence to suggest that such mechanisms exist in all universities in Kenya. The absence of a mechanism to curb fraudulent publishers can easily lead to a high rate of infiltration of low-quality publications that will in turn undermine the research output of developing countries.

The fast-changing academic publishing industry and the emergence of new models of OA scholarly communication present a wonderful opportunity to increase the visibility of research coming from developing countries like Kenya. However, OA also presents practical challenges, and this calls for mentoring programs to empower academic researchers to better understand OA. Some of these challenges include a lack of mechanisms to guide academic researchers on where and how to publish, a dearth of APC funding mechanisms, and a lack of accreditation mechanisms for regional and national journals. Such deficiencies are likely causing researchers to fall prey to unscrupulous journal publishers. If this trend is left unchecked in Kenya and other developing countries, it will cause great damage to the publication output from these countries

and will further marginalize their researchers. It is high time that universities in Africa and in Kenya in particular put in place strategies to address the problem of fraudulent OA publishers and build a capacity for researchers to identify reputable publishers.

In view of the foregoing results, further study is needed to determine the extent to which Kenyan researchers are aware of and utilize fraudulent OA publishers. In addition, bibliometric studies should be conducted to analyse the publication output of academic researchers and determine the extent of OA adoption in Kenya. Such work would provide information on how far fraudulent journals have penetrated in Kenya. In addition, policy makers and university managers could use empirical evidence from such studies to put in place mechanisms and strategies that can safeguard the quality of publications coming from Kenya's universities.

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