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Awareness of Open Data among Researchers in Selected Public Universities in Tanzania

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Abstract
This study explored the extent of researchers' awareness on open data (OD) in selected universities in Tanzania. Various scholars have highlighted several benefits that are associated with the adoption and use of Open Datathat include validation and accountability of research findings, minimization of duplication of studies, protectionof researchintegrity and increased visibility of both research results as well as the host institution.The study employed a cross-section research design which combined qualitative and quantitative approaches. A sample of 200 researchers was drawn from a sampling frame of 1846 using both probability and non-probability sampling techniques.The findings of this study have revealed that majority of respondents lacked a deep understanding of OD concept.Based on the findings,the study recommends that open data weeks and open data days should be adopted and used by academic and research institutions to create awareness on OD. Academic institutions need to integrate OD and research data management in course of their degree programmes, especially at postgraduate level. Awareness creation mechanisms such as workshops should regularly be used to create OD awareness at all levels of academic institutions.

Keywords: Open data, Higher learning institutions, Research data management, Tanzania, Research data sharing, Open science

Introduction
Open data is among the building blocks of Open Science (OS) initiative that seeks to make research data share-able and re-usable for the advancement of science. Open science intends to facilitate the creation of public scientific goods through sharing research output and improving research collaboration in the research life cycle (Arza & Fressoli, 2018). Open data, as one of the components of the research life cycle,is still new in the world of information and communication technology(Schopfel, Chaudiron, Jacquemin, Severo & Thiault, 2014; Susha, Grönlund & Janssen, 2015).The InternationalOpen Data Charter (2015) defines OD as "digital data that is made available with the technical and legal characteristics necessary for it to be freely used, reused, and redistributed by anyone, anytime, anywhere". Proponents of OD believe in two criteria that characterize it:firstis itsfree availability online,andsecond is its use of a format that allows re-use (Huston et al., 2019).

Scholars have highlighted several benefits of using Open Data in scientific activities. These include improving scientific efficiency, democratization of scientific knowledge, and improving research capacity to attend to societal needs (Arza & Fressoli, 2018). Therefore, Open Data as a global movement, intends not only to improve scholarly communication and advance research,

but also to transform modern societies and enhance informed decisions making (Huston et al., 2019). Other important benefits of Open Data include enhancing validation and accountability of research findings, reducing duplication of research, protecting the integrity of research, and increasing the visibility of both research results and institutions in general(Bangani & Moyo, 2019; Chigwada, Chiparausha, & Kasiroori, 2017; Deards, 2013; Gewin, 2015).

In addition, there are three major benefits of OD.These include political and social ones such enhancement of democracy, accountability and transparency; economic ones such as stimulation of innovation, economic growth, and competitiveness; andthe third one which has to do with operations and techniques such as ability to reuse available data, improvement of public policies, making fair decisions, and data validation(Janssen, Charalabidis, & Zuiderwijk 2012).In fact, if researchers are not aware on OD, it will not be possible for them to adopt any OD initiatives. In other words,with knowledge of OD, duplication of research activities will continue, resulting in wastage of money and time.

Open Data movement is slowly gaining momentum thanks to the support it is accorded by universities, research institutions, and funding agencies. Support comes is form offormulation ofOD policies, funding of OD projects, and creation of technical infrastructure that advances OD implementation. Policies that facilitate OA operationalization are considered as important vehicles for enhancing participation, interaction, self-empowerment, and social inclusion of citizens (Zuiderwijk & Janssen, 2014).

As a result, various universities and research institutions have adopted Open Data implementation strategies so as to rip all the benefits associated with research data especially in ensuring increased transparency and enhanced citizen engagement in the development process. For instance, universities such as Essex, University of Sheffield (in UK.), Massachusetts Institute of Technology (MIT) in USA and several others world-wide have adopted OD sharing policies. However, the adoption of the same islimited in Africa,save for some South African institutions that have been instrumental in advocating for Open Data. A good example of an OD national initiative can be drawn from Namibia where the country has established a national data portal through Namibia Statistics Agency (NSA) that intends to make data sets available, open and in reusable formats (Amugongo, Muyingi, & Sieck, 2015)

In Tanzania, there are some baselines for OD take-off. Theseincludethe development of aNational OD Policy draftandthe establishment of the government open data portal available through www.opendata.go.tz. In fact, in the process of carrying out this study,it has been learned that another data repository is available and being hosted by Ifakara Health Institute, a Non-Governmental research instituteat http://data.ihi.or.tz/. However, on the whole, the adoption of Open Data in the country is still low. This has been attributed to various factors including lack of awareness among scholars and the general public(Avuglah, 2016; Joseph, 2017).

The extent of researchers' awareness of OD, especially in universities in Tanzania is unknown. There are limited studies related to awareness of open data among scholars in Tanzania. Among the notable ones available, Shao and Saxena(2019) focused on open government data initiatives in Tanzania, Worker andExcell(2018) studied about open data for climate change, and Mushi, Deventer, & Pienaar(2020) investigated the implementation of Research Data Management

(RDM).The absence of such information is likely to contribute to delayed or slow take-off OD initiative and actual utilization of Open Data in the country. As such, this study focused on filling the knowledge gap on researchers'awareness of open data in Universities in Tanzania.

Literature Review

The review of literature explores the extent of awareness of Open Data among researchers as reported by various scholars from different academic and research institutions from all over the world. The literature provides insights on the extent of awareness on Open Data and awareness of Open Data opportunities, and highlights sources from which scholars acquire information about Open Data.

The extent of awareness on OD

Awareness creation is the first and key step towards adoption and implementing Open Data projects in universities and research institutions. There is a direct link between people's awareness and the adoption of new technologies (Houtkoop et al., 2018). In fact, awareness creation is a key in ensuring the utilization of a particular technology. Recent studies on Open Data have noted low level of awareness among scholars on the concept of OD. For example,in their study,Jaakkola, Mäkinen, and Eteläaho (2014) found that awareness on the concept of Open Data is relatively low; a state associated with very low experience with the phenomenon, including lack of knowledge on business opportunities associated with Open Data. The same was noted by Janssen, Charalabidis and Zuiderwijk (2012) who observed a lack of knowledge among researchers in the use and interpretationof data collected by other researchers. Lack or insufficiency of awareness of Open Data is a clear setback for progress ondata utilization.

The literature reviewed hasalso revealed the existence of myths that have a negative impact on Open Dataawareness among scholars. Lack of proper education on the use and handling of Open Data and the benefits accrued from it benefits may not be well understood among researchers. For instance, Kahn (2014) observes that the term data sharing to some South African researchers means using other researchers' data without the obligation to release their own for other researchers to use. Similarly, Bangani and Moyo(2019) report that some South African researchers believe that sharing research data means using data from other researchers despite being less keen to make their research data open for use by others. These studies clearly indicatea lack of proper knowledge on the concept of Open Data among scholars.

Awareness of the OD opportunities

Scholars'awareness of opportunities presented by Open Data is very crucial in enhancing the uptake and utilization of the data in universities and research institutions. In fact, lack of awareness among citizens on the opportunities that come with OD is an obstacle towards the realization of OD projects goals (Amugongo, Muyingi, & Sieck, 2015). Several counties have made it mandatory for researchersto make their data openly available for reuse, scrutiny, and validation. For example, the European Commission (EU) has urged its member states to make data collected from government organizations open(European Commission, 2017; Jaakkola et al., 2014). This move was motivatedby the economic value of the data, their potential role in addressing societal challenges, the need to foster participation of citizens in political and social life, and the urge to increase government transparency (Jaakkola et al., 2014).

Sources of information about Open Data

There are different methods (both offline and online media)that have been proven to be effective in creating OD awareness among citizen. Offline media includes journals, proceedings, newspapers, magazines, and several other print materials. In this digital age, online media such as social media, online TVs, online magazines, and others seem to be the most effective meansof awareness creation especially among learned societies such as universities and research organizations. However, while self-learning through exposure to different sources of information including online sources is considered effective, learning that involves face to face exchange of information such as during workshops, seminars and the like is known to have more impact. Amugongo, Muyingi, and Sieck (2015) noted that online media (such as information portals) alone does not guarantee success in creating OD awareness among large populations. In fact, the media is more effective when working with people with relevant education.

To sum up the literature reviewed under this study, while the concept of Open Data has existed for more than a decade, mixed perceptionsregarding it exist among researchers. In particular, while in some countries, researchers appear to be well aware of the concept (Tripathi, Chand, Sonkar,& Jeevan, 2017), researchers in other countries seem to lack that awareness(Cox & Pinfield, 2014). In fact, some have appeared to confuse the term with some other initiatives such as open access (Buys & Shaw, 2015).

Methodology

A cross-section survey design was conducted to carry out this study at the University of Dar es Salaam (UDSM) and the University of Dodoma (UDOM). The design employed both quantitative and qualitative approaches of research. The population targeted by the study included academic staff of the respective institutions and potential OD managers. It was believed that this group of respondents would provide the enough insightsregarding OD awareness. The study employed both probability and non-probability sampling techniques to obtain a sample for the study. Specifically, stratified sampling technique was applied to select researchers while purposive sampling was applied to select potential OD managers for this study. A total of twelve OD potential managers (six from UDSM and six from UDOM) were selected based on their OD roles. These were Directors of Research and Publication, Directors of Library Services, University Chief Corporate Officers, Directors of Quality Assurance, Directors of Postgraduate Studies, and Directors of ICT. The study's sample size was proportionately calculated using Yamane's (1967) formula using a sampling frame determined from UDSM and UDOM's facts and figures documents. At the time of the survey, UDSM had a total of 1164 academic staff while UDOM had a total of 782 academic staff.The degree of accuracy used by this study was 10%. Through calculations, a sample of 95 respondents was arrived at using the formula;meaning that the number of respondents to participate in this study was required to be not less than 95. As such, 200 questionnaires were distributed during data collection. From these, 147 were completed and returned. The number of questionnaires distributed at each university was based on the number of researchers each institution had at the time of the survey. Based on that, 116 questionnaires were distributed at UDSM and 84 were distributed at UDOM as shown in Table 1.

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Table1: Questionnaires distribution for UDSM and UDOM

	Population	%	Sample Size
UDSM	1164	58%	116
UDOM	782	42%	84
Total	1846	100%	200

Data were also collected using interviews with key informants (potential OD managers). The obtained data were analysed quantitatively using IBM SPSS Statisticsversion 22 while qualitative data were analysed based on themes of the content.

Research Findings

Respondents' Demographic Characteristics

Two hundred (200) questionnaires were distributed but 147 werereturned. The demographic characteristics of respondents who filled questionnaires were as follows: Males were 89(60.5%), while females were 58(39.5%). In terms of age: 6 (4.1%) respondents were aged between 18 and 25,20 (13.6 %,) were over 55 years old, other 20 (13.6%)were aged between 46 and 55,44 (29.9%)were aged between 26 and 45, and 57 (38.8%) were aged between 36 and 45 years. Regarding education, the findings show that majority (84; 57.1%)had master's degrees while PhD degree holders were57 (38.8%) and bachelor degree holders were 6 (4.1%).

Publication Experience

Experience in doing research is considered to increase the likeliness of someone to be aware of OD initiatives. As such, researchers were asked to indicate how long they had engaged in research activities. From the survey; 49 (33.3%) respondents had 3-5 years of experience, 45 (30.6%) had experience of 6-8 years, 35 (23.8%) were involved in research for more than 8 years, while18 (12.2%) had less than three years of research experience. The results further show that26 (17.7%) respondents had published 5 to 10 research articles, 11 (7.7%) had published 10 to 20 articles, 94 (63.9%) had published 5 to 10 articles, only 5 (3.4%) had published more than 20 articles while those that had never published any article were 11 (7.55%). Moreover, the findings show that 59 (40.1%) respondents preferredpublishing in both open access and non-open access journals, 47 (34.6%) said they prefer publishing in non-open access journals while 30 (21.3%)said they preferred publishing inopen access journals. More details on these findings are indicated in Tables 2, 3 and 4.

Table 2: Experience in doing Research (N = 147)

INST.	Less than 3 years		3-5 years		6-8 years		Above 8 years		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq	%	Freq.	%
UDSM	8	5.4	26	17.7	28	19.0	22	15.0	84	57.1
UDOM	10	6.8	23	15.6	17	11.6	13	8.8	63	42.9
Total	18	12.2	49	33.3	45	30.6	35	23.8	147	100

Source: Field Data (2020)

Table 3: Number of Research Articles Published (N = 147)

INST.	Never published		1-5		6-10		11-20		Above 20		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
UDSM	4	2.7	57	38.8	10	6.8	8	5.5	5	3.4	84	57.1
UDOM	7	4.8	37	25.1	16	10.9	3	2.0	0	0	63	42.9
Total	11	7.5	94	63.9	26	17.7	11	7.5	5	3.4	147	100

Source: Field Data (2020)

Table 4: Frequently used journal for publication (N = 136)

INST.	Open Access		Non-open access		Both Open and non-open access		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
UDSM	17	12.5	32	23.6	31	22.8	80	58.8
UDOM	13	8.8	15	11	28	20.6	56	41.2
Total	30	21.3	47	34.6	59	40.1	136	100

Source: Field Data (2020)

Awareness on Open Data

The study measured researchers and potential OD mangers' levels of awareness on OD initiatives. This was done by inquiring about their knowledge on the term OD, how they acquired the knowledge, their awareness on OD repositories, their awareness on any local or international OD initiatives, as well as their knowledge on potential benefits of OD.

Knowledge of the term Open Data

To establish researchers' awareness on OD, respondents were askedif they have come across or heard the term OD. The responses received were used to generate the finding in table 5.

Table 5: Researchers'knowledge of the term Open Data (n=147)

INST.	Aware		Not aware		Total	
	Freq.	%	Freq.	%	Freq.	%
UDSM	46	31.3	38	25.9	84	57.1
UDOM	44	29.9	19	12.9	63	42.9
Total	90	61.2	57	38.8	147	100

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Table 5 shows that 90 (61.2%) respondents had come across or heard the term OD while 57 (38.8%) said they had not done so. Moreover, the findings show that 51.1% (46) of those who were aware of the term were at the University of Dar es Salaam and 48.9% (44) were at the University of Dodoma. Therefore, 66.7% (38) of respondents who did not come across or hear the term were at UDSM while 33.3% (19) were coming from UDOM

Acquisition of Knowledge on Open Data

Respondents that had come across or heard the term OD were asked to sate how they came to know the term. Results obtained show that respondents came across the term through various means as indicated in Table 6. The findings show that33 (22.4%) respondents indicated that they first heard or come across the term through workshop training, 20 (13.6%) indicated that they first came across the term through their colleagues, 16 (10.9%) showed that they knew heard or come across with the term through personal studies. The results further show that 13 (8.8%) respondents said they learned about the term from a publisher while 7 (4.8%) mentioned media, and one respondent mentioned formal training as part of a degree programme.

Table 6: How researchers came across with the term Open Data (n=90)

SOURCE	UDSM		UDOM		Total	
	Freq.	%	Freq.	%	Freq.	%
Workshop training	13	14.4	20	22.2	33	36.6
Colleagues	07	7.8	13	14.4	20	22.2
Media	06	6.7	01	1.1	07	7.8
Publisher	06	6.7	07	7.8	13	14.4
Personal Studies	13	14.4	03	3.3	16	17.8
Others(Taught in class)	01	1.1	00	00	01	1.1
Total	46	51.1	44	48.9	90	100

Source: Field Data (2020)

Knowledge on Open Data Repository

To confirm the ODknowledge researchers indicated to have, respondents of this study were asked if they were aware of any OD repository. The results obtained are indicated in Table 7. The results show that 69 (76.7%) respondents with knowledge of OD concept said they were aware ofat least one existing OD repository while 21 (23.3%) said they were not aware of any. In other words, majority of researchers with knowledge of OD concept were aware of the existence of OD repositories. These results are a match of those of Tripathiet al (2017)who found high awareness on OD and RDM issues. In contrast, Ng'engo (2018) and Cox and Pinfield (2014)found low awareness on OD and RDM issues. Additionally, the results also appear to show that more researchers at UDOM are knowledgeable about OD repositories than those at UDSM. See Table 7.

Table 7: Knowledge on Open Data Repository (n=90)

INST.	Yes		No		Total	
	Freq.	%	Freq.	%	Freq.	%
UDSM	32	35.6	14	15.6	46	61.2
UDOM	37	41.1	07	7.7	44	38.8
Total	69	76.7	21	23.3	90	100

Source: Field Data (2020)

Awareness on Open data initiatives

Further, respondents who had heard or come across the term OD were then asked if they were aware of any OD initiative taking place either in Tanzania or anywhere in the world. The results generated are indicated in Table 8.

Table 8: Awareness on Open Data initiatives (n=90)

OD initiatives awareness	UDSM		UDOM		Total	
	Freg	%	Freq.	%	Freq.	%
Aware	21	23.3	17	18.9	38	42.2
Not aware	26	28.9	26	28.9	52	57.8
Total	47	52.2	43	47.8	90	100

Source: Filed data (2020)

Table 8 shows that only 38 (42.2%) respondents were aware of some OD initiatives while majority 52 (57.8%) said they were not aware of any initiatives of that nature.

Benefits of Open Data

Figure 1 shows respondents' opinions on the potential benefits of OD. A question on OD benefits was directed to respondents that said they had knowledge of term OD. In respondents' opinions, OD are beneficial because they:increase thelikeliness of research articles being accepted for publication(19; 12.9%), provide room for collaboration (36; 24.5%), give room for critiques (38; 25.9%), increase confidence of research findings (39; 26.5%), increase visibility of researchers' articles (40), enhance institution visibility (44; 29.9%), contribute to open access (48), minimise duplication of research efforts (55), and enhance transparency of research findings (57). These results appear to indicate that most researchers with knowledge of OD also know their benefits.

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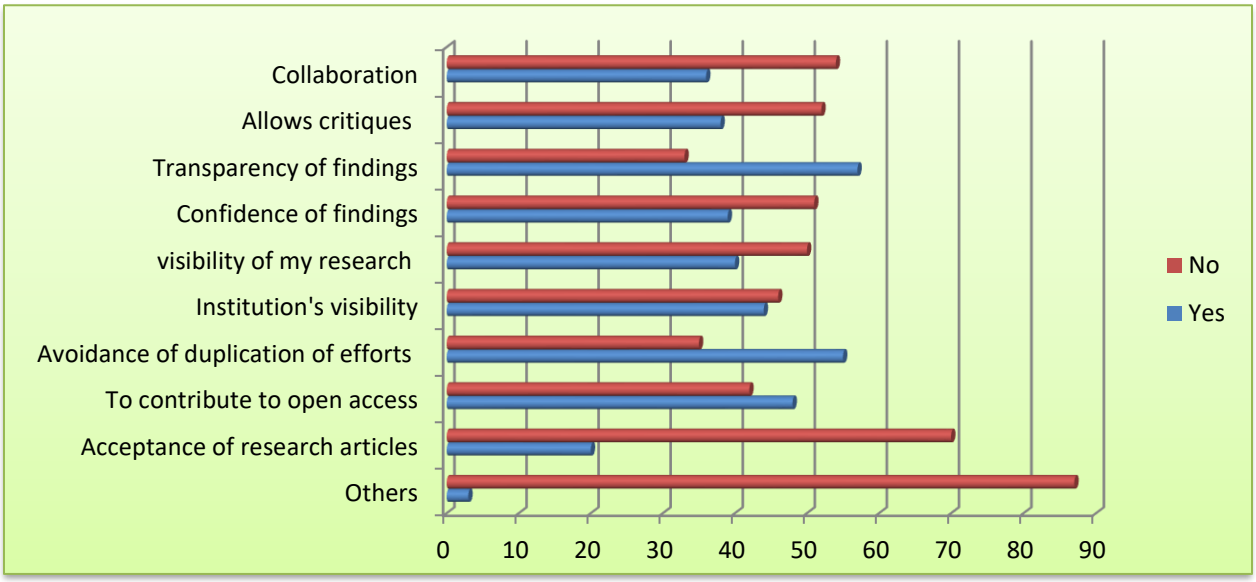

Figure 1: Awareness on Benefits of Open Data (n=90)

Source: Field Data (2020)

Discussion of Findings

Although the term OD is still considered new, especially in developing countries, a significant number of researchers at the institutions under study showed awareness of the concept. This is an encouraging sign of researchers' readiness to adopt OD. As asserted by Muneja(2016) and Kimaryo(2016), awareness is the main indicator of readiness to adopt or exploita technology or a solution. This means that the more aware an individual is about a new technology, the more the chances of her or him to exploit it. These findings are in line with what Tripathiet al (2017), in a study conducted in India, found. The researcher found that researchers had at leastgeneral awareness on the term OD. In contrast, Cox and Pinfield(2014) found that most researchers had not heard or come across the term OD and had understandably low general knowledge on OD initiatives.Key informant interviewsinvolving twelve OD potential managers show that they were all aware of OD initiatives; implying that it would be easy for their respective institutions to adopt OD. Also, all the Directors involved in the study appeared to know some existing OD initiatives, as most of them indicated to have obtained their academic qualifications at universities that supportOD or research data management. Interviews have also shown that most OD potential managers believed that researchers did not have any knowledge on matters to do with OD. This is contrary to results from questionnaires which have shown that researchers were generally knowledgeable about OD but lacked knowledge on specific issues.

Taking into account the number of respondents selected at each of the universities under study, UDOM (69.8%) appears to have more researchers aware of the term OD than UDSM(54.8%). In

fact, 45.2% of respondents at UDSM were not aware of the term compared to UDOM's 30.2%.This difference was not expected considering the fact that UDSM is the oldest university in the country, with more experienced researchers who, in a different circumstance,should be more knowledgeable about the whole OD concept. The result can be attributed to various factors,including: most researchers at UDSM appearing toprefer publishing innone-open access journals as compared to those at UDOM. In fact a study by Muneja and Ndenje-Sichalwe(2017) showed low awareness on issues related to open accessamong academic community members in Tanzania. The results can also be attributed to the fact that more research on data managementhave been conducted at UDOM. This might have helped to raise awareness on OD among researchers. In addition, more appears to be happening at UDOM regarding OD than at UDSM. For instance, during interviews, the Director of Research and Publication of UDOM revealed that the University has been offering training on matters related to research data management as part of training on research processes. The University has also been reported to have started celebratinga yearly Open Data Weekwhich ends in a climax named Open Data Day. These developments must have something to do with the higher OD awareness among UDOM's researchers.

According to this study, the means through which researchers become aware ofthe concept of OD and associated initiatives directlydetermine their knowledge on the same. Regarding this, the study has found that researchers at the two institutions under study had acquired OD knowledge through various means, some of which were not formal. This can be attributed to the newness of OD concept to both the institutionshence the absence of formalized initiatives on the same. Since majority of researchers became aware of OD initiatives through informal means, the quality of their knowledge could be questionable.According toKassen (2018), sources of knowledge determine the quality of knowledge available. In fact Amugongo et al. (2015) asserted that getting knowledge through informal waysdoes not guarantee making someone knowledgeable. As such, the need for the two universities to establishformal ways for creating awareness on OD initiatives is clear.

Although researchers appear to be aware of the concept of OD, an insignificant number of them are aware ofavailable OD initiatives. While this can be attributed to the newness of the conceptof OD, it also stressesthe need for putting in place OD awareness creation strategies and mechanisms. The result can also be attributed to the insufficient attention paid to OD initiatives by media or researchers' forums (Al-Hasan, 2008). According to these results, majority of the researchers who are aware of OD, lack specific knowledge on the same. These findings echo those reported by Buys and Shaw (2015) who found that most researchers in America had general knowledge on OD and research data sharing but lacked specific knowledge.In contrast, Tripathiet al (2017)found that researchers in India had both general and specific knowledge on OD and data sharing.

Most of them were able to mention correctly initiatives related to OD. Some of the mentioned initiatives were; open map street, global tobacco surveillance system, OD initiatives by World Bank, d-lab, open land data, Tanzania Biodiversity Information Facility (TanBIF), Global Biodiversity Information Facility (GBIF), open government data portal and OD initiatives by internet society. But very few respondents were not able to correctly mention these initiatives as

they appeared to confuse with open access initiatives. Those who were not able to mention OD initiatives, they mentioned UDSM institutional repository, Directory of Open Access Journals (DOAJ), UDOM institutional repository, International Network Availability for Scientific Publications (INASP), also they mentioned some of the subscribed databases such as HINARI and AGORA, findings matching with those of Kahn (2014) and Bangani and Moyo (2019) who also found mixed awareness on the term OD. Though those who were not able to correctly mention the initiatives were very few, there is a need for the responsible units to assert correct knowledge to the researchers especially on OD and research data management. These results are matching with those of Buys and Shaw (2015) who also found that researchers in America, were also thinking having knowledge and publishing on open access journals implied knowledge on OD.

Furthermore, the findings show that the researchers with OD knowledge were aware of a number benefits of adopting the approach to manage data. According to the findings, enhancement of research findingstransparency and minimization of duplication of research efforts are the most known OD benefits among researchers of the two institutions. Very few of them saw OD as the means for allowing critiques of their research findings and a means for the collaboration. The fact that very few researchers saw OD as the means for allowing critiques of the research findings, may imply that, researchers may not like OD initiatives to be used for criticizing their findings and could also be interpreted that most of the researchers see OD as a threat to their research findings once, their research data being used to criticize their findings. However, although limited, the researchers' knowledge of the benefits of OD can have an implication on their readiness to adopt the approach in their research activities. According to previous studies (Janssen et al., 2012; Zuiderwijk et al., 2012), knowledge of OD benefits, including understanding OD as a way of sharing data to minimize duplication of efforts in research can strongly influence researchers into sharing their data. Unfortunately, very few researchers were aware of other benefits including finding OD asa means for enhancing collaboration in research.This is likely hinderingresearchers' adoption of OD initiatives. Tenopir et al.(2011) asserted that if OD is to be adopted by researchers, the first step should having them recognize the benefits of doing so.

Conclusion and Recommendation

Based on the findings of this study, it appears that most researchers at the surveyed institutions alreadyknow the term OD. This implies that the researchers have general knowledge on OD.The findings further show that while there are various ways through which researchers could learn about OD, the knowledge most researchers have has been obtained frominformal sources. It is fair to state that there are limited efforts to create OD awareness among researcher at the universities under study. This obviously undermines the chances of seeing researchers adopt this approach to data management. In fact, the researchers' lack of knowledge on potential benefits of OD means it is very unlikely that OD will be adopted. Therefore this study concludes that, despite the OD concept being new, there was significant level of awareness on OD issues among researchers of the selected higher learning institutions. The study also concludes that, the creation of awareness on OD, is very critical and it is a continuous process. Based on the findings,the study recommends that open data weeks and open data days should be adopted and used by academic and research institutions to create awareness on OD.

Academic institutions need to integrate OD and research data management in course of their degree programmes, especially at postgraduate level. Awareness creation mechanisms such as workshops should regularly be used to create OD awareness at all levels of academic institutions.

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