

Sokoine University of Agriculture



PhD Thesis

Using Open Access Institutional Repositories (OAIRs) for Enhancing Access to Local Contents in Tanzanian Universities

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**Using Open Access Institutional Repositories (OAIRs)
for Enhancing Access to Local Content in Tanzanian
Universities**

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in Fulfillment of the
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EXTENDED ABSTRACT

Open Access Institutional Repositories (OAIRs) are technologies that enhance access to local content produced by academic staff members in universities. However, these OAIRs in Tanzania have fewer uploaded scholarly contents produced by academic staff members than is the case with OAIRs of universities in other countries.

This study investigated how OAIRs in Tanzania enhance access to local content to meeting the diverse information needs of potential users. Specifically, the study established the extent to which academic staff members engage in self-archiving of local contents in OAIRs, and determined factors that influence self-archiving of local contents in OAIRs, the usage patterns of OAIRs and how OAIR policy can be used to improve the collection of OAIR contents in selected universities in Tanzania.

The study area includes four selected public universities in Tanzania namely: Mzumbe University (MU), University of Dar es Salaam (UDSM), Muhimbili University of Health and Allied Sciences (MUHAS), and Sokoine University of Agriculture (SUA). This study was guided by the pragmatic paradigm; and used a cross-sectional survey research design to investigate how OAIRs in Tanzania enhance access to local content to meet the diverse information needs of potential users. The study involved 2894 participants including 413 (academic staff) that were obtained through systematic random sampling, four Heads of Department, two ICT technicians, and two Library Technicians. These eight key informants were selected through purposive sampling techniques.

The study collected both qualitative and quantitative data. Interviews and structured questionnaires were used to collect primary data while literature on OAIRs, OAIR policy documents, and statistics from ROAR and Open DOAR were

used to collect secondary data. The SPSS version 22-computer software programme was used to analyse quantitative data where descriptive and inferential statistics were obtained. Content analysis was used to analyse qualitative data, which were presented in a narrative form.

The thesis is organized in paper format. The first paper explored academic staff members' engagement in depositing locally produced content in OAIRs in public universities in Tanzania. Findings showed that 92.5 per cent of the academic staff members were aware of the OAIRs and 46.2 per cent reported to engage themselves in self-archiving their scholarly works in OAIRs. Furthermore, the study revealed that poor Internet connectivity and unstable power supply were the challenges academic staff members faced in depositing their scholarly publications in OAIRs.

The second paper investigated how the self-archiving of scholarly publications in OAIRs can be strengthened for improved access to local content in Tanzania. Findings showed that the self-archiving of scholarly publications in OAIRs is influenced by factors such as motivating, technical support, influence of colleagues, OAIRs policy, and supporting services. Likewise, the study revealed, the lack of personal benefit, inadequate advocacy, the low level of awareness, the lack of sufficient ICT infrastructure and plagiarism as barriers against self-archiving.

The third paper investigated how OAIR submission policy can be used to improve OAIR contents. Findings showed that the OAIR submission policy is available in their universities, as reported by 46.2 per cent of the respondents. The findings also revealed that OAIR submission policy has been used to direct academic staff to submit their scholarly publications in OAIRs (45.5%). Furthermore, in order to improve the collection of OAIR contents, regular awareness creation of the rules and regulations on how to submit in OAIRs was

cited 24.5 per cent of the respondents as important strategy of increasing the use of OAIRs cited. About 18.5 per cent of the respondents suggested effective implementation of OAIR submission policy for academic staff members to submit in the university OAIRs as another strategy. About 16.3 per cent suggested for an increase visibility and accessibility of OAIR policy through the university website; and about 14 per cent suggested that OAIRs submission policy be made clear to authors and the institutions operating the OAIRs.

The fourth paper investigated the usage patterns of OAIRs among academic staff members in Tanzanian universities. Findings indicated that 43.7 per cent of the respondents used OAIRs for accessing and downloading scholarly publications, 40.7 per cent used OAIRs for browsing and reviewing scholarly publications for teaching, learning, and research work and 32.9 per cent used OAIRs for self-archiving their scholarly outputs. Likewise, the study found that motivation and social factors were the only variables that had a unique influence on the use of OAIRs at a 1 per cent level of significance ($p=0.000$). Furthermore, awareness creation of the use of OAIRs and the provision of enough digital skills and ICT infrastructure were found important in improving the use of OAIRs.

From the foregoing findings and observations, it is concluded that academic staff members are not engaged much in self-archiving their scholarly publications in OAIRs, and the OAIRs policy regarding submission requirements is not implemented as intended; as a result, local contents are poorly uploaded in OAIRs. Therefore, the management of universities should engage academic staff members in self-archiving their academic publications in OAIRs, raise awareness of staff; improve staff's digital skills; provide adequate ICT facilities, manuals and technical assistance to staff on the use of OAIRs and self-archiving; and implement OAIR submission policy in the collection of OAIR contents.

These will increase the amount of content and thereby enhance access to local content in OAIRs.

Keywords: Open Access Institutional Repository (OAIRs), local content, scholarly publications, research outputs, self-archiving, usage pattern of OAIRs, OAIR submission policy, academic staff members, Tanzania.

IKISIRI KUU

Repositories za Taasisi ya Upataji wazi (OAIRs) ni teknolojia ambazo huongeza ufikiaji wa yaliyomo ndani yanayotokana na wafanyikazi wa masomo katika vyuo vikuu. Walakini, hizi OAIR nchini Tanzania zimepakia yaliyomo chini ya wasomi yaliyotolewa na wafanyikazi wa masomo kuliko ilivyo kwa OAIRs ya vyuo vikuu katika nchi zingine.

Utafiti huu ulichunguza jinsi OAIRs nchini Tanzania inavyoongeza ufikiaji wa yaliyomo katika kukidhi mahitaji anuwai ya habari ya watumiaji wanaoweza. Hasa, utafiti huo ulianzisha kiwango ambacho wafanyikazi wa masomo wanajihusisha na kujitambua kwa yaliyomo katika OAIRs, na sababu zilizoamua ambazo zinashawishi kujisajili kwa yaliyomo katika OAIR, mifumo ya matumizi ya OAIRs na jinsi sera ya OAIR inaweza kutumika kuboresha ukusanyaji wa yaliyomo katika OAIR katika vyuo vikuu vilivyochaguliwa nchini Tanzania.

Eneo la utafiti linajumuisha vyuo vikuu vinne vya umma vilivyochaguliwa nchini Tanzania ambavyo ni: Chuo Kikuu cha Mzumbe (MU), Chuo Kikuu cha Dar es salaam (UDSM), Chuo Kikuu cha Afya na Sayansi ya Ushirika (MUHAS), na Chuo Kikuu cha Kilimo cha Sokoine (SUA). Utafiti huu uliongozwa na dhana ya pragmatic; na kutumia muundo wa utafiti wa sehemu ya msalaba ili kuchunguza jinsi OAIRs nchini Tanzania inavyoongeza ufikiaji wa yaliyomo ndani kukidhi mahitaji ya habari anuwai ya watumiaji wanaoweza. Utafiti huo ulihusisha washiriki 2894 ikiwa ni pamoja na 413 (wafanyikazi wa taaluma) ambao walipatikana kupitia sampuli za kimfumo za nasibu, Wakuu wanne wa Idara, mafundi wawili wa ICT, na mafundi wawili wa Maktaba. Waandishi hawa wakuu wanane walichaguliwa kupitia mbinu za sampuli za utakaso.

Utafiti ulikusanya data zote za ubora na za kiwango. Mahojiano na dodoso zilizoandaliwa zilitumika kukusanya data ya msingi wakati fasihi kwenye OAIRs, hati za sera za OAIR, na takwimu kutoka ROAR na Open DOAR zilitumika kukusanya data ya sekondari. Programu ya programu ya kompyuta ya toleo la SPSS ilitumika kuchambua data ya upimaji ambapo takwimu za kuelezea na za upendeleo zilipatikana. Mchanganuo wa yaliyomo ulitumiwa kuchambua data ya ubora, ambayo iliwasilishwa kwa fomu ya simulizi.

Thesis imeandaliwa katika muundo wa karatasi. Karatasi ya kwanza iligundua wafanyikazi wa masomo' ushiriki katika kuweka yaliyomo ndani ya OAIR katika vyuo vikuu vya umma nchini Tanzania. Matokeo yalionyesha kuwa asilimia 92.5 ya wafanyikazi wa masomo walikuwa wanajua OAIRs na asilimia 46.2 waliripoti kujihusisha na kujisajili katika kazi zao za wasomi huko OAIRs. Kwa kuongezea, utafiti huo umebaini kuwa unganisho duni la mtandao na usambazaji wa nguvu usio na msimamo ndio changamoto ambazo wafanyikazi wa masomo walikabili katika kuweka machapisho yao ya wasomi huko OAIRs.

Karatasi ya pili ilichunguza jinsi kujitambua kwa machapisho ya wasomi katika OAIRs kunaweza kuimarishwa kwa ufikiaji bora wa yaliyomo nchini Tanzania. Matokeo yalionyesha kuwa kujitambua kwa machapisho ya wasomi katika OAIR kunasukumwa na sababu kama vile kuhamasisha, msaada wa kiufundi, ushawishi wa wenzake, sera ya OAIRs, na huduma zinazounga mkono. Vivyo hivyo, utafiti huo ulifunua, ukosefu wa faida ya kibinafsi, utetezi duni, kiwango cha chini cha uhamasishaji, ukosefu wa miundombinu ya kutosha ya ICT na wizi kama vizuizi dhidi ya kujitawala.

Karatasi ya tatu ilichunguza mifumo ya matumizi ya OAIR kati ya wafanyikazi wa masomo katika vyuo vikuu vya

Tanzania. Matokeo yalionyesha kuwa asilimia 43.7 ya waliohojiwa walitumia OAIRs kupata na kupakua machapisho ya wasomi, asilimia 40.7 walitumia OAIRs kuvinjari na kukagua machapisho ya wasomi kwa kufundisha, kujifunza, na kazi ya utafiti na asilimia 32.9 walitumia OAIRs kwa kujisajili matokeo yao ya wasomi. Vivyo hivyo, utafiti uligundua kuwa motisha na sababu za kijamii ndizo tu ambazo zilikuwa na ushawishi wa kipekee juu ya utumiaji wa OAIRs kwa kiwango cha asilimia 1 ya umuhimu ($p = 0.000$). Kwa kuongezea, uundaji wa uhamasishaji wa matumizi ya OAIR na utoaji wa ujuzi wa kutosha wa dijiti na miundombinu ya ICT ilipatikana muhimu katika kuboresha utumiaji wa OAIRs.

Karatasi ya nne ilichunguza jinsi sera ya uwasilishaji ya OAIR inaweza kutumika kuboresha yaliyomo OAIR. Matokeo yalionyesha kuwa sera ya uwasilishaji ya OAIR inapatikana katika vyuo vikuu vyao, kama ilivyoripotiwa na asilimia 46.2 ya waliohojiwa. Matokeo hayo pia yalifunua kuwa sera ya uwasilishaji ya OAIR inatumiwa kuelekeza wafanyikazi wa masomo kuwasilisha machapisho yao ya wasomi katika OAIRs (45.5%). Kwa kuongezea, ili kuboresha ukusanyaji wa yaliyomo OAIR, uundaji wa mara kwa mara wa sheria na kanuni juu ya jinsi ya kuwasilisha katika OAIRs ilitajwa asilimia 24.5 ya waliohojiwa kama mkakati muhimu wa kuongeza utumiaji wa OAIRs zilizotajwa. Karibu asilimia 18.5 ya waliohojiwa walipendekeza utekelezaji mzuri wa sera ya uwasilishaji ya OAIR kwa wafanyikazi wa masomo kuwasilisha katika OAIRs ya chuo kikuu kama mkakati mwingine. Karibu asilimia 16.3 walipendekeza kuongezeka kwa mwonekano na upatikanaji wa sera ya OAIR kupitia wavuti ya chuo kikuu; na karibu asilimia 14 walipendekeza kwamba sera za uwasilishaji za OAIR ziwe wazi kwa waandishi na taasisi zinazofanya kazi kwa OAIRs.

Kutoka kwa matokeo yaliyotangulia na uchunguzi, inahitimishwa kuwa wafanyikazi wa masomo hawashiriki sana katika kujisajili machapisho yao ya wasomi huko OAIR, na sera ya OAIR kuhusu mahitaji ya uwasilishaji haitekelezwi kama ilivyokusudiwa; kwa sababu hiyo, yaliyomo ndani hayapaki vizuri katika OAIRs. Kwa hivyo, usimamizi wa vyuo vikuu unapaswa kushirikisha wafanyikazi wa masomo katika kujisimamia machapisho yao ya kitaaluma katika OAIR, kuongeza uhamasishaji wa wafanyikazi; kuboresha ujuzi wa dijiti wa wafanyikazi; kutoa vifaa vya kutosha vya ICT, miongozo na msaada wa kiufundi kwa wafanyikazi juu ya utumiaji wa OAIR na kujiendesha; na kutekeleza sera ya uwasilishaji ya OAIR katika ukusanyaji wa yaliyomo OAIR. Hizi zitaongeza kiwango cha yaliyomo na kwa hivyo kuongeza ufikiaji wa yaliyomo katika OAIRs.

DECLARATION

I, **Anna Shangwe Mbughuni**, do hereby declare to the Senate of Sokoine University of Agriculture that this thesis is my original work done within the period of registration and that, it has not been submitted neither is it been concurrently submitted in any other institution.

Anna Shangwe Mbughuni
(PhD Candidate)

Date

The above declaration is confirmed by:

Prof. Wulystan P. Mtega
(Supervisor)

Date

Dr. Malekani Andrew
(Supervisor)

Date

LIST OF PUBLISHED PAPERS AND MANUSCRIPTS

1. Mbughuni, A.S., Mtega, W.P. and Malekani, A.W. (2018). Exploring academic staff engagement in depositing locally produced research content in open-access institutional repositories in Tanzania. Published by *IFLA Journal* 48(4). Available at <https://doi.org/10.1177/0300352211069157>
2. Mbughuni, A.S., Mtega, W.P. and Malekani, A.W. (2022). Self-archiving of Scholarly Publications for improved access to local content in Tanzania: A study of Open Access Institutional Repositories in universities in Tanzania. Published by the *Journal of Librarianship and Information Science*. Available at <https://doi.org/10.1177/09610006231155182>
3. Mbughuni, A.S., Mtega, W.P. and Malekani, A.W. The Influence of Open Access Institutional Repository Submission Policy in the collection of OAIR contents. Submitted to *Electronic library*.
4. Mbughuni, A.S. (2022). Usage patterns of Open Access Institutional Repositories in Tanzania. Published by the *Library Philosophy and Practice (ejournal)*.

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DEDICATION

This work is dedicated to my late lovely parents: my mother Enny Stanley Mmbaga (deceased in July 2020) and my father Prof. Essay Stanley Mmbaga (deceased in April 2022) and my lovely husband Shangwe Azaria Mbughuni (deceased in December 2021). They all died when I was in the middle of this study. It was painful, hard to take and very hard to concentrate but with the hand of God, all was possible. This work is also dedicated to my lovely children Catherine, Azaria, and Stanley Jr.

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ORGANIZATION OF THE THESIS

This thesis is organized into six chapters. Chapter one provides general introduction, statement of the problem, justification of the study, the study objectives, and the theoretical and conceptual frameworks of the study, measurement of constructs, general methodology and study limitations. The information from Chapter two to chapter five is about the published papers and manuscripts which emanate from specific objectives of the study. Chapter six is the General discussion while chapter seven is about general conclusion and recommendation.

LIST OF ABBREVIATION AND ACRONYMS

CoNAS	College of Natural and Applied Sciences
DIIT	Department of Informatics & Information Technology
DOAR	Directory of Open Access Repositories
HoD	Head of Department
ICT	Information and Communication Technology
IR	Institutional Repository
IFLA	International Federation of Library Associations and Institutions
MM	Motivational Model
MU	Mzumbe University
MUHAS	Muhimbili University of Health and Allied Sciences
OA	Open Access
OAIRs	Open Access Institutional Repositories
OPAC	Online Public Access Catalogue
PCU	Model of PC Utilization
ROAR	Registry of Open Access Repositories
SNAL	Sokoine National Agricultural Library
SCT	Social Cognitive Theory
SPSS	Statistical Package for the Social Sciences
SUA	Sokoine university of Agricultural
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UDSM	University of Dar Es Salaam
URT	United Republic of Tanzania
UTAUT	Theory of Acceptance and Use of technology
www	World Wide Web

1.0 CHAPTER ONE: GENERAL INTRODUCTION

1.1 Background to the Study

Information resources are very important as they impart knowledge and skills and enhance improved academic performance (Dimkpa, 2015). In universities, lecturers, researchers, and students create and use information resources. University libraries manage and disseminate information resources related to universities' core disciplines. To enhance access to information resources, university libraries have to provide platforms through which library users can access information resources.

Before the emergence of the Internet and Information and Communication Technologies (ICTs), access to scholarly communication was very low (Ammarukleart, 2017) because libraries had to provide information resources through print media. Thus, the emergence of Information and Communication Technologies (ICTs) has brought new opportunities for creating, storing and disseminating scholarly content (Islam and Akter, 2013). Through ICTs, libraries can provide several services including but not limited to Online Public Access Catalog (OPAC), electronic publications (such as electronic journals, and electronic books), networked scholarly communication and digital archives (Narendra, 2017). One development, which is central to the start and developments in ICTs, is the institutional repository (Dubinsky, 2014).

An Institutional Repository (IR) is any digital archive that preserves and disseminates intellectual publications of the institution (Bamigbola and Adetimirin, 2017). It is an innovative and substitute technology for scholarly communication, which provides long-term preservation and enhances free accessibility of scholarly materials to the university community (Lynch, 2003). Institutional

Repositories (IRs) use two models of information delivery: open and closed access models.

Chirwa and Sife (2018) define Open Access (OA) as a model of scholarly communication in which access to digital content is provided to users free of charge and without copyright restrictions. On the other hand, a closed access model is used when digital content is only accessible in institutions or by people with licenses to access resources from closed databases. Therefore, this study concentrated on Open Access Institutional Repositories where the content available in the repository is open and freely accessible to user groups that use Open Access Model. According to Ukwoma and Ngulube (2019), Open Access Institutional Repositories (OAIRs) are online databases for preserving local content that can be accessed freely and promptly without restriction. Originally, OAIRs were initiated in the early 1990s after the emergence of the Internet and the World Wide Web (WWW) in 1989 (Pew Research Centre, 2014). Therefore, the introduction of OAIRs has a link to the Open Access movement where some IRs have adopted the open access model by providing free access to scholarly content through OAIRs (Bangani, 2018). OAIRs have been widely adopted as open platforms for enhancing access to publications produced by learning and research institutions.

Europe, the Americas, and Asia were the first continents to embrace OAIRs in 1990s (Lynch and Lippincott, 2005). At the time of the current study, the Directory of Open Access Repositories listed in the USA had 925 OAIRs, Japan 657, the UK (325), and Germany 297 OAIRs (Open DOAR, 2023). In Africa, OAIRs were developed in 1998 (Nyambi and Maynard, 2012). In 2023, the Directory of Open Access Repositories listed South Africa as having 50 OAIRs, Morocco 3, Egypt 9, and Nigeria 33 OAIRs (Open DOAR, 2019). In sub-Saharan Africa, Ethiopia had six OAIRs,

Zimbabwe had 11 OAIRs, and Mozambique had two OAIRs. Likewise, Zambia had three, Rwanda had two, and Malawi had three OAIRs (Open DOAR, 2019). In East Africa, Kenya had 46, Uganda had 15, and Tanzania had 16. In addition, statistics show that the number of uploaded contents in OAIRs on other continents is higher is the case in other African continents (Open DOAR, 2023). The high number of uploaded contents in these continents is reported to be a result of the availability of internet infrastructures, supportive ICT, and the support of users (Adewumi, 2012).

These OAIRs archive scholarly publications, which involve thesis, dissertations, teaching materials, and articles, are generated by academic staff members from their academic doings in an institution. Scholarly publications are considered essential in meeting local information needs and providing knowledge to the institution communities (Saulus *et al.*, 2017). For Scholarly publications to be accessed, it is significant to deposit them frequently in OAIRs. Scholarly publications can be deposited by engaging authors (academic staff members) in self-archiving or by using library staff who are the guardians of OAIRs. Therefore, self-archiving can be defined as the manner academic staff members (authors) involve themselves in depositing scholarly publications in OAIRs. This process increases the number of contents in OAIRs because without the help of authors, library staff cannot deposit all scholarly publications produced by academic staff members. Self-archiving also lowers the cost of buying and subscribing resources such as books and journal articles, which might not be afforded by institutions (Mbughuni *et al.*, 2022).

Institutions and institution communities use OAIRs for different purposes, including, collecting, preserving, and disseminating scholarly publications to the university community. Academic staff members use OAIRs to upload,

deposit or self-archive, download, and access scholarly publications for academic purposes such as teaching, research, and learning. In addition, members of the academic staff use OAIRs as a publication platform and for browsing and reviewing different publications (Akparobore and Omosekejimi, 2020; Gohain and Angadi, 2020; Mbughuni *et al.*, 2022; Bamigbola and Adetimirin, 2018, and Kakai, 2018). Moreover, the use of OAIRs in Africa was recorded as low as compared to the use of the same in other continents such as Europe, Asia, America, and Australia, which were reported to have higher usage (Okumu, 2015). The low usage of OAIRs in Africa is caused by different challenges such as low submission of OAIRs content, inadequate ICT infrastructure and the lack of OAIR policy (Kari and Orji, 2022; Baro *et al.*, 2022; Fasae *et al.*, 2017; Nwakaego, 2017).

Most of these challenges were overcome by the formulation of the OAIR policies (Ukwoma and Ngulube, 2019). OAIR policies direct who can use the services, the type of contents to be deposited, the terms and conditions of preservation, access and withdrawal and day-to-day operations (Koulouris *et al.*, 2013; Mwalubanda, 2021; Ukwoma and Ngulube, 2019; Nunda and Elia, 2019; Chilimo, 2015). For example, the OAIR policy was initiated in 2008 in different institutions in the USA and in other countries to overcome the challenges encountered by different OAIRs users (Saini, 2018). OAIR initiated policies included a metadata reuse policy; full-text data reuse policy, content policy, submission policy, and preservation policy. The submission policy was initiated to improve the collection of OAIR contents. The policy directs academic staff members and researchers to submit their scholarly publications in OAIRs. This strategy helps OAIRs to accumulate and increase the number of OAIR contents. As reported by Roy *et al.* (2018), recently, more than three

hundred institutions, funding agencies, and academic programmes around the world have developed the OAIR policy.

1.1.1 OAIRs in Tanzania

In Tanzania, OAIRs were introduced in 2012 with the same aim of collecting, preserving, and disseminating intellectual works created by academics in the academic and research institutions (Muneja and Sichwale, 2016). During this study, Tanzania had 16 OAIRs (OpenDOAR, 2020). The first OAIRs was introduced in 2009 at the University of Dar es Salaam (UDSM) with 15,991 contents, followed by Mzumbe University (MU) in 2010 (with 4,402 contents), Sokoine University of Agriculture (SUA) in 2011(4,590 contents), and Muhimbili University of Health and Allied Sciences (MUHAS) in 2012 (2565 contents) and other universities and institutions followed later. The contents deposited in these OAIRs are few as compared to the scholarly publications produced by academic staff members in the university. Universities OAIRs need to grow and to have sufficient content to meet the diverse information needs of potential users.

1.2 Statement of the Problem

More than 1500 academic staff members and researchers in Tanzania produced scholarly publications from their research and other academic activities. These scholarly publications can be deposited or self-archived in OAIRs to provide access to a wide range of universities within and outside. For example, in 2011-2012 and 2016-17, academic staff members at the University of Dar es Salaam produced 448 conference and journal papers, 25 research reports, 19 books, and 19 book chapters. In addition, there are OAIRs policies that mandate academic staff members to submit or self-archive their scholarly publication in the university

OAIRs. Despite this fact, the number of scholarly publications deposited in Tanzania (112,167) OAIRs is still low compared to scholarly publications deposited in the OAIRs of other countries such as South Africa (153,639) and Kenya (136,275) (Kayungi *et al.*, 2021, Mwalubanda, 2021; Nunda and Elia, 2019; Mnzava and Chirwa, 2018; Malekani and Kavishe, 2018; Muneja and Ndenje-Sichale, 2016). Therefore, this study investigated why academic staff members in Tanzanian universities do not self-archive their scholarly publications in OAIRs.

1.3 Justification for the Study

This study was conducted to investigate the extent to which academic staff members engage in self-archiving scholarly publications in OAIRs, to assess factors that influence archiving (deposition) of local contents in OAIRs, to analyse the usage pattern of OAIRs, to determine the influence of the existing OAIR policy in improving the collection of OAIR contents in selected universities in Tanzania. The study findings provide inputs to universities and research institutions in Tanzania aimed at strengthening OAIRs to enhance access to local content among different reader groups and to inform institutions, universities, and governments in formulating OAIRs policy that would be operative. Such OAIRs policies would be advantageous to academic staff members and researchers in self-archiving scholarly publications in OAIRs. In addition, the study findings enlighten academic staff members and researchers on OAIRs as tools for self-archiving scholarly publications and a source for accessing research outputs. Self-archiving would increase the visibility of scholarly publications. Access to research outputs in OAIRs can help in generating knowledge. The study is also in line with the nation's research agenda and the nation's ICT Policy of 2006 (URT, 2016) and the role of Information Communication

Technology (ICTs) in achieving the Sustainable Development Goal (SDGs) number 9 (nine) on innovation and infrastructure, which insists on the provision of greater access to education through technological innovation.

1.4 Objectives of the Study

1.4.1 Overall objective

The main objective of this study was to investigate how OAIRs in Tanzania enhance access to local content to meet the diverse information needs of academic staff members.

1.4.2 Specific objectives

This study specifically intended to:

- i. Examine the extent to which academic staff members engage in self-archiving of the local content in OAIRs in selected universities.
- ii. Assess factors that influence archiving (deposition) of local contents in OAIRs among academic staff members.
- iii. Determine the influence of the existing OAIR policies in improving the collection of OAIR contents in selected universities in Tanzania.
- iv. Analyse the usage patterns of OAIRs by academic staff members.

1.5 Research Questions

- i. To what extent do academic staff members engage in self-archiving of the local contents in OAIRs?
- ii. Which factors influence the archiving (deposition) of local contents in OAIRs?
- iii. What are the usage patterns of OAIRs by academic staff members?
- iv. How the existing OAIR policies influence the collection of OAIR contents in selected universities in Tanzania?

1.6 Theoretical and Conceptual Framework of the Study

1.6.1 Theoretical frameworks

Several theories and models explain the factors that influence the acceptance and use of technology. These models include, Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), and the Diffusion of Innovation theory (TPB). Others include the Theory of Reasoned Action (TRA), Model of Personal Computer Utilization (PC), Motivational Model (MM), Unified Theory of Acceptance and the Use of Technology (UTAUT), and Social Cognitive Theory (SCT). These theories, which explain behaviours, attitudes, social interactions, acceptance, and the use of a technology, were used by different researchers to guide their studies in identifying different factors that influence the acceptance and use of a technology. These theories were adopted or modified to formulate the conceptual framework to suit different studies (Adeoye and Olanrewaju, 2019; Saulus *et al.*, 2018).

This study decided to use the Unified Theory of Acceptance and Use of Technology (UTAUT model) and formulated the conceptual framework based on this theory. The model was chosen because it was thought as relevant in the context of the current study, because the UTAUT model explains user intentions to use an information system, which in this study is OAIR (Ammarukleart, 2017; Kripanont, 2007; Dulle and Majanja, 2011; Dulle 2010; Lwoga, 2006).

1.6.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) examined the acceptance of technology,

determined by the effects of performance expectancy, effort expectancy, social influence, and facilitating conditions. UTAUT was developed by Venkatesh and others in 2003. The theory has four significant variables: effort expectancy (EE), performance expectancy (PE, social influence (SI) and facilitating conditions (FC) and four significant moderating variables which include gender, experience, age and voluntariness of use (See Figure 1.1).

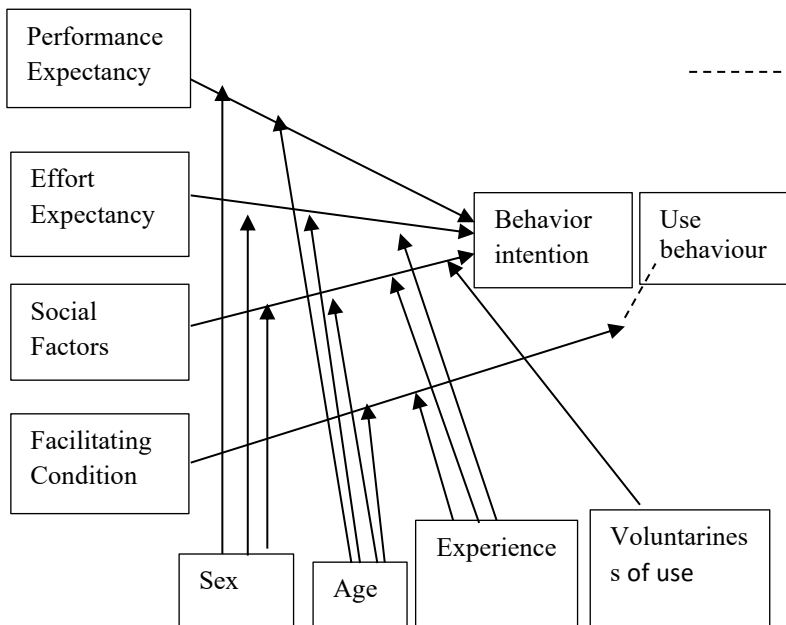


Figure 1.1: UTAUT Model by Venkatesh *et al.*, (2003)

1.6.3 Conceptual framework

The conceptual framework was formulated from the UTAUT model. The conceptual frame was formulated to guide the study according to the nature of the study area. Therefore, the conceptual framework retained the four dependent variables from the UTAUT model and introduced some new variables (moderator) which were used to determine the

factors that influence the use of OAIRs. The conceptual framework comprised key independent variables: Effort Expectancy (Procedures involved and the level of technical skills needed), Performance Expectancy (Perceived usefulness and outcome expectations), Social Influence (Influence of peers, the influence of supervisors and culture), and Facilitating Conditions (ICT infrastructure, the Internet speed, technical support, policy and procedure manual). The control variables (moderators) are age, sex, computer literacy and experience. Moreover, the dependent variable is OAIRs' use. The conceptual framework replaced voluntariness with computer literacy. Computer literacy was introduced in the framework because it was found very important for the use of OAIRs (see Figure 1.2). Therefore, the framework was used to guide the study in finding out factors that influence the use of OAIRs.

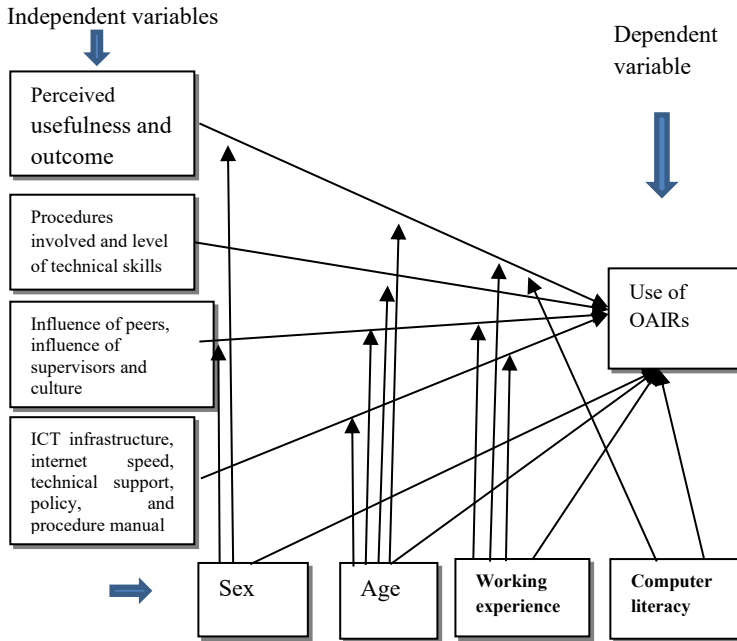


Figure 1.2: The modified UTAUT Model

The research conceptual framework shows the relationship between independent variables and the use of OAIRs, and the relationship between moderators and independent and dependent variables.

1.6.4 Measurement of constructs

The study used the UTAUT model to validate the variables under the study with some modifications during the study. For example, the study eliminated the voluntariness (moderator) from the original model, and this was substituted by computer literacy, the level of education and awareness, which were thought useful in using OAIRs. Overall, the findings are in line with the modified UTAUT model; therefore, the framework was validated and was found fitting with the present study very well.

1.7 General Methodology

The methodology section describes the methodology for all published papers and manuscripts. The following were included in the methodology: research paradigm, research design, study population, unity of analysis, sampling techniques and sample size. Others include data collection methods and instruments, data analysis, validity and reliability of instruments and data and ethical considerations.

1.7.1 Research Paradigm

There are different research paradigms used in research including pragmatism, interpretivism, positivism, and post-positivism. This study was guided by the pragmatic paradigm. Pragmatism is a paradigm that claims to bridge the gap between the scientific method and structuralist orientation of older approaches and the naturalistic methods and freewheeling orientation of newer approaches (Creswell 2013). This paradigm was used because it enables the researchers to conduct research in innovative and dynamic ways and finding solutions to research problems.

1.7.2 Research Design

The present study employed a cross-sectional survey research design, which allows the gathering of data from many individuals at a single point in time (Cresswell, 2002). Unlike other designs, a cross-sectional survey research design was appropriate in this study because it allowed comparing many different variables at the same time. For example, in this study age, sex and education level were compared in relation to the use of OAIRs. In addition, this design does not require a lot of time and is not costly therefore, it was suitable to a researcher as a student who had limited time of only one year for data collection.

1.7.3 Research Approach

The study applied both qualitative and quantitative approaches, which were chosen because the study objectives required both quantitative and qualitative data. Therefore, the research adopted the two approaches to overcome the limitations of using one approach and complementing it with the strengths of another (Boru, 2018). The quantitative approach was used to collect data on the extent to which academic and research staffs are involved in self-archiving of local contents in OAIRs. The qualitative approach was employed to establish the factors influencing self-archiving of local content in OAIRs, the usage patterns of OAIRs by academic staff and research fellows and the influence of the existing OAIRs policies in improving OAIRs content in selected universities in Tanzania.

1.7.4 Area of the study

The study area covered four public universities in Tanzania namely, Muhimbili University of Health and Allied Health Science (MUHAS), Mzumbe University (MU), Sokoine University of Agriculture (SUA), and the University of Dar es Salaam (UDSM). These universities were selected because they had operative OAIRs that collect, preserve and disseminate knowledge to the university community. These OAIRs also had long experience in operation, which was deemed suitable in providing enough information needed in the study. Moreover, these OAIRs have been registered by OpenDOAR, therefore, they were deemed appropriate in offering substantial secondary data.

1.7.5 Study Population

The study population included academic staff members, Heads of Libraries/ ICT Technicians, and library staff. These were the target population because they produce content and use OAIR; they are also guardians and policymakers of

the OAIRs. In this study, the units of analysis were academic staff members of the selected universities.

1.7.6 Sampling techniques and sample size

In this study, probability and non-probability sampling techniques were used to acquire the sample size of the study. Systematic sampling and purposive sampling were the sampling procedures used. A systematic sampling procedure was used to select academic staff members (researchers, lecturers, and librarians). To obtain the sample size, lists of academic staff members were collected at the university concerned where every sixth academic staff member (a sampling interval) was randomly selected. Thus, 413 respondents were obtained as the sample size by using Slovin ($n=N/(1+Ne^2)$) formulae. Out of the 413 academic staff, 34 were from MU, 219 were from the UDSM, 61 from SUA and 99 were from MUHAS (See Appendix 1 for the calculation of the sample size and the sampling frame).

Purposive sampling was used to select Heads of University Libraries, ICT Technicians, and Library Technicians who were key informants in the study. Eight key informants were selected, where two key informants represented one university.

1.7.7 Data collection methods and instruments

Structured questionnaires were used to collect quantitative primary data. Questionnaires were prepared and tested for reliability. Twenty (20) questionnaires were pre-tested from one of the universities, which were not the target site for the study. The Cronbach Alpha was used to measure the internal consistency (reliability) of the research instrument to establish its reliability. Questionnaires were administered to 413 respondents. About 292 questionnaires were

successfully filled and returned, making a return rate of 70.7 per cent (See Appendix 6).

Qualitative primary data were collected through interviews with key informants (four Heads of the Library Department, two ICT Technicians, and two Library Technicians) and a documentary review. Key informants were included in this study because they were deemed experienced and knowledgeable, and thus appropriate for the topic under investigation (See Appendix 7).

Secondary data were obtained from documentary sources such as policy documents, existing literature on OAIRs, the Directory of Open Access Repositories (OpenDOAR) and the Registry of Open Access Repositories (ROAR).

1.7.8 Data analysis methods

The collected quantitative data were analysed using the Statistical Package for Social Sciences (SPSS) version 22, which was used to generate descriptive and inferential statistics. In the descriptive statistics, frequencies, percentages, and means were computed while inferential statistics employed Binary logistic regression analysis. Content analysis was used to analyse qualitative data, which were presented in the narrative form (see Appendix 3).

Binary logistic regression statistics were used in this study to indicate the relationship between OAIRs usage (dependent variable) and the factors influencing OAIRs usage (independent variables). The Binary logistic regression model used was as follows,

$$L_i = \left(\ln \frac{P_i}{1-P_i} \right) = Z_i = \beta_0 + \beta_1 X_i + \dots + \beta_n X_n$$

Where: L_i is the log of the odds ratio, Ln is the logit, Z_i (dependent variable) stands for usage of OAIRs (with a value of 1 for the researchers who are willing and using OAIRs and 0 for the researchers who are not willing and not using

OAIRs). X_i (Independent variables) refers to the researcher's characteristics and institutional factors (See Appendix 3).

1.8 Study Limitations

The study encountered some limitations in the research design, response rates, and gathering of data that are worth acknowledging. Firstly, since the present study was cross-sectional (due to limitations in time and financial resources), it was not possible to capture variations in scholarly publications over many years beyond the ones under review. However, the researcher managed to collect data for the given period. Secondly, even though the study used questionnaires and interviews to women and men, the response rate for women was low, which might create a risk of bias. This bias was addressed through triangulation of information from other data collection tools used in the study. Thirdly, participating institutions in this study were only four public universities and not all universities. Thus, the study lacked information from private and other public universities with OAIRs. However, the information collected from these four universities was deemed adequate in reflecting university staff practices on self-archiving of local contents in OAIRs in Tanzania. Currently, Tanzania has 14 OAIRs; since the study did not cover all the institutions with OAIRs, there is still a room for future research on this topic. Despite the limitations, the study was carried out and limitations were addressed as indicated.

2.0 CHAPTER TWO

Exploring Academic Staff Engagement in Depositing Locally Produced Research Content in Open Access Institutional Repositories in Tanzania

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Abstract

This study explored academic staff engagement in depositing locally produced content in open access institutional repositories in public universities in Tanzania. The general objective of this study was to establish the extent to which academic staff are engaged in depositing locally produced content in open access institutional repositories. The study employed a cross-sectional research design. Data was collected using a structured questionnaire, which was administered to 292 academic staff selected through systematic random sampling. Purposive sampling was used to select 14 key informants. The results reveal that 92.5% of the respondents were aware of the presence of open access institutional repositories and 46.2% of the respondents had self-archived their academic work in open access institutional repositories. Poor Internet connectivity, low bandwidth, and a time-consuming and unstable power supply were the challenges encountered by the academic staff in the process of uploading their work. Several recommendations are suggested to expedite the process.

Keywords

Depositing, locally produced content, open access institutional repository, self-archiving, research output, Tanzania

Introduction

Open access institutional repositories (OAIRs) are gaining popularity in the academic arena because of their potential to facilitate the availability and accessibility of locally produced research output for a wider community. An OAIR is 'a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members' (Lynch, 2003:). OAIRs facilitate the storage and accessibility of locally produced content generated by university communities. They also increase the accountability and promotion of locally produced

content, and increase the visibility of the university (Abdelrahman, 2017; Saini, 2018).

A number of OAIRs have been established in different countries around the world. Their establishment has been spearheaded by the advent of Internet technologies, which enable libraries to deposit locally produced content and enhance its availability and

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accessibility for the user community. Europe, Asia, Australia and the Americas were the first regions to adopt OAIRs. In Africa, OAIRs were started in 1998 (Nyambi and Maynard, 2012). At the time the present study was conducted, the Directory of Open Access Repositories listed South Africa (43) and Kenya (43) as having the most OAIRs, followed by Nigeria (30; OpenDOAR, 2020). In Tanzania, OAIRs were first adopted in 2009 at the University of Dar es Salaam (UDSM), followed by Mzumbe University (MU) in 2010, Sokoine University of Agriculture (SUA) in 2011, and Muhimbili University of Health and Allied Sciences (MUHAS) in 2012.

The success of OAIRs in universities requires enough rich content to meet the needs of the user community. This locally produced content can be monographs or peer-reviewed journal articles, as well as electronic theses or dissertations and other digital assets such as data sets, course notes, learning objects or conference proceedings. Locally produced content is generated or produced by academic staff and students in the university from their academic work. Locally produced content is considered to be very important as it provides knowledge to the university community, satisfies local information needs, enhances self-reliance, enable intra and extra digital divide, enhances easy and free community access to information, and gives a community an identity as it mirrors real-life situations and operations (Saulus et al., 2017). For this local content to be visible, it is important to deposit it in OAIRs.

The depositing of locally produced content in OAIRs can be defined as the process whereby library or academic staff upload locally produced content in university OAIRs. In the past, it was librarians who normally deposited content in university OAIRs because they were the custodians of the OAIRs. Nowadays, library staff alone cannot manage to deposit all of the content created by university communities because it is difficult to know what has been created by academic staff or researchers. The engagement of academic staff in depositing locally produced content in OAIRs is therefore very important. Engagement can be defined as the way in which academic staff are involved in the process of depositing locally produced content in university OAIRs by either willingly giving their work to be deposited or self-archiving without the help of a librarian. Self-archiving is the act of (the author) depositing a free copy of an electronic document online in order to provide open access to it (Harmad, 2001).

Engaging academic staff in depositing or self-archiving locally produced content in OAIRs is very important in the academic arena. It increases the amount

of content available in OAIRs, provides sufficient information resources for the academic community, and decreases the costs of buying information resources such as books and journals, which are expensive. It also provides full-text scholarly publications that are free from copyright and licensing restrictions. Generally, the depositing of locally produced content in an institutional repository provides a diversity of information for the community within and outside the institution cheaply and without restrictions (Jain, 2013).

In order to engage academic staff fully in depositing their locally produced content in OAIRs, universities in Tanzania have formulated OAIR policies, which serve as a guiding framework to ensure the maximum dissemination of research generated by the university community. For instance, the OAIR policies at SUA and MUHAS mandate that all academic staff submit their peer-reviewed research output to the OAIR, and require the immediate depositing of peer-reviewed research in the university OAIR. However, the policies at the UDSM and MU require that only the abstract of an article be deposited in the OAIR. Despite the availability of OAIR policies at the universities in this study, the engagement of academic staff in depositing or self-archiving their locally produced content in OAIRs is low (Mnzava and Chirwa, 2018). Therefore, this study set out to investigate the extent to which academic staff are engaged in depositing or self-archiving their locally produced content in OAIRs in Tanzania.

Statement of the problem

In Tanzania, there are more than 1500 academic staff who have produced scholarly publications from their research and other academic activities. For example, from 2011–2012 to 2016–2017, the academic staff (1045) at the UDSM produced 448 conference and journal papers, 25 research reports, 19 books and 19 book chapters (<https://www.udsm.ac.tz>) (University of Dar es Salaam facts and figures 2011–2012 to 2016–2017). Moreover, there are OAIR policies which mandate that academic staff deposit their locally produced content in university OAIRs. Despite these policies, the amount of content deposited in OAIRs in Tanzania is very low (OpenDOAR, 2020). According to OpenDOAR's (2020) figures, Tanzania has 112,167 content items deposited in its OAIRs, which is a much smaller number than South Africa, with 153,639, and Kenya, with 136,275 (Bangani, 2018; OpenDOAR, 2020). One would have expected that because of the large number of academic staff in Tanzanian public universities and the amount of research produced, the number of

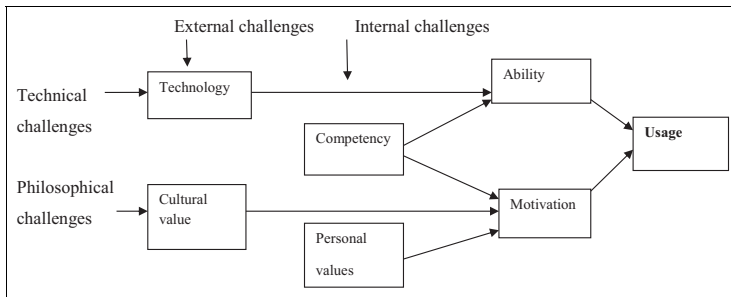


Figure 1. Quadratic Usage Framework (Marshall, 2007).

deposited local content items would be high. The low amount of content hinders the accessibility and visibility of the universities. This study was therefore conducted to investigate the extent to which academic staff are engaged in depositing or self-archiving locally produced content in OAIRs in Tanzania.

Objective of the study and conceptual framework

The general objective of this study was to establish the extent to which academic staff in public universities in Tanzania engage in depositing locally produced content in OAIRs.

Specifically, the study sought to (1) find out the level of awareness among academic staff of OAIRs; (2) indicate the extent to which academic staff engage in self-archiving locally produced research content in OAIRs; and (3) reveal the challenges encountered when self-archiving locally produced content in OAIRs.

Research questions

From the objectives of the study, the following research questions were formulated:

1. What is the level of awareness of OAIRs among academic staff?
2. To what extent do academic staff engage in self-archiving locally produced research content in OAIRs?
3. What are the challenges encountered by academic staff when self-archiving locally produced content in OAIRs?

Conceptual framework

This study was guided by the Quadratic Usage Framework in establishing the extent to which academic staff

in public universities in Tanzania engage in depositing or self-archiving locally produced content in OAIRs. The Quadratic Usage Framework is an advanced model which includes more factors that can assist in explaining factors that influence the acceptance, intention to use and usage of technology (Marshall, 2007). In this study, the Quadratic Usage Framework was modified by replacing factors with challenges that were thought to be suitable to reflect the study. The Quadratic Usage Framework guided the study to find the level of awareness of OAIRs among academic staff and the extent to which academic staff engage in depositing or self-archiving their locally produced content in OAIRs (see Figure 1).

There are several assumptions implied in this model; one is that real usage of a certain technology requires both ability and motivation (Mardis et al., 2008; Marshall, 2007; Mtega et al., 2014). The first element in this model is the technology, which refers to the functionality of a system – for example, the hardware, software and physical setting of usage. The second is competence, which lies in the knowledge and skills necessary to operate that technology. The third element is cultural value, which involves challenges related to policy, values, beliefs, culture, voluntariness and social influences. These challenges can influence the use of technologies. The fourth element is personal value. This is the user's attitude towards participation – for example, intention, desire, pleasure, enjoyment, fulfillment, anxiety and all the other challenges that distinguish one user from another and the user from their environment are linked to the individual user's motivation and choice.

In the context of this study, technology means the tool – the OAIR – which henceforth is an information and communications technology (ICT) component. Competence relates to the knowledge, skills and ability to use OAIRs to deposit locally produced content.

Cultural and personal values are the challenges influencing the depositing of locally produced content in OAIRs, either positively or negatively, as they affect people's ability to deposit local content in OAIRs.

Literature review

Level of awareness of OAIRs among academic staff

An OAIR is a digital system that captures and preserves the intellectual output of a single university or multi-university community (Bamigbola and Adetimirin, 2017; Omeluzor, 2014). Worldwide, OAIRs are growing very quickly, but some faculty members in universities do not know of their existence (Dutta and Paul, 2014; Rehman et al., 2019). However, recent studies carried out at Annamalai University, Tamil Nadu, India, and in Nigeria report that despite efforts by universities to establish OAIRs, there were some academic staff who were not aware of the existence of OAIRs in their universities (Aghwotu and Ebiere, 2016; Dhanavandan and Tamizchelvan, 2013). Despite the fact that some academic staff are aware of the presences of OAIRs in their universities, the amount of content deposited in OAIRs is low, especially in Tanzania (Chilimo, 2016; Mnzava and Chirwa, 2018; Samzug, 2017). Therefore, this study was conducted to find out the level of awareness of the presence of OAIRs in universities and the process of self-archiving locally produced content in university OAIRs.

Extent to which academic staff are engaged in self-archiving locally produced research content in OAIRs

The objective of OAIRs in universities is to capture and collect different publications, research output and teaching documents, which can then be accessed and used by the university community. However, building an effective OAIR collection requires the involvement of both academic staff and library staff in depositing or self-archiving locally produced content. The involvement of academic staff is very important because they are the ones who produce content from their research and academic activities. This was also revealed by Musa et al. (2016: 41) who reported the most critical issue that lies behind the success of any institutional repository is self-archiving among academic staff.

There are several advantages to engaging academic staff in self-archiving locally produced content in OAIRs. Abuabdallah (2014) mentions accessibility, publicity, academic rewards and professional recognition, and sharing scientific knowledge for the benefit of others. Despite the good number of OAIRs that

have been established and benefit from the depositing or self-archiving of locally produced content, there are still challenges involved in self-archiving by academic staff. Most academic staff do not engage in self-archiving or give their academic work to be deposited in university OAIRs (Aghwotu and Ebiere, 2016; Dutta and Paul, 2014; Ezema and Okafor, 2015; Halder and Chandra, 2012; Omeluzor, 2014). Other studies have also found that there are several challenges with regard to depositing or self-archiving locally produced content in OAIRs, such as lack of awareness of the process, time limitations, lack of technical skills, an unstable network and electricity problems (Halder and Chandra, 2012; Mnzava and Chirwa, 2018; Omeluzor, 2014). Different studies have been carried out in Tanzania (Chilimo, 2016; Mnzava and Chirwa, 2018; Samzug, 2017) but it is still not clear how academic staff engage in self-archiving, which drove the researchers to embark on this study.

Challenges encountered when self-archiving locally produced content in OAIRs

Several studies have reported on the low uptake of self-archiving locally produced content in OAIRs. Even though OAIRs provide room to deposit, store and disseminate locally produced content, faculty members are reluctant to take advantage of this. In a study carried out by Kim (2011) and reported by Yang et al. (2015) on the factors that frustrated faculty contributions to OAIRs, copyright issues, time and effort were seen as challenges hindering participation in self-archiving. Singeh et al. (2013) share a Malaysian case; they found that fear of plagiarism prevented authors from self-archiving in OAIRs. Moreover, Singson et al. (2015) indicate that the lack of a good understanding of publishers' licensing policy was a challenge that faced academic staff and librarians when self-archiving. Ezema (2011), Okoye and Ejikeme (2011), and Saini (2018) share the Nigerian experience and found that lack of interest, fear of copyright violation and plagiarism (Nwokedi and Nwokedi, 2018) were the main challenges in self-archiving. It is not known whether the same challenges apply to academic staff in the Tanzanian context, therefore this study present study is empirically set to investigate.

Methodology

This study was conducted at four selected public universities in Tanzania – namely, MUHAS, MU, SUA and the UDSM. These four public universities were selected based on the criteria that they have operational OAIRs and their OAIRs are old enough to offer

Table 1. Sampling frame.

University	Academic staff (n)	Proportion from the required $n = (N / 2894)^* 413$
MUHAS	693	99
MU (main campus)	236	34
SUA (only main campus and Solomon Mahlangu Campus (SMC))	427	61
UDSM (main campus)	1538	219
Total	2894	413

insights and data for the present study. Moreover, these OAIRs have been registered by OpenDOAR, which was thought to offer substantial secondary data for the study.

The study used a cross-sectional research design because it allowed data to be collected at a single point in time and also allowed for a questionnaire survey (Sedgwick, 2014). This was possible because the study was limited to one year only to obtain important data.

The total population for this study was 2894 academic staff (senior lecturers, lecturers and assistant lecturers). The sample size was obtained by using Slovin's formula: $n = N / (1 + Ne^2)$, where n = sample size, N = total population (2894) and e = margin of error (0.05). Therefore $n = 2894 / (1 + 2894 \times 0.052) = 2894 / 2895 \times 0.0025 = 2894 / 7 = 413$.

A systematic random sampling technique was used to obtain representatives from each university. The lists of academic staff were collected at the university concerned and a systematic random selection of every sixth academic staff member on the lists was carried out to obtain the respondents for the study. Therefore, out of the 413 academic staff, 34 were drawn from MU, 219 from the UDSM, 61 from SUA and 99 from MUHAS (see Table 1).

Purposive sampling was used to obtain key informants (heads of department, ICT technicians and library technicians), who were involved in managing OAIRs, knowledgeable and experts in the area of study.

The quantitative data was collected using a structured questionnaire. Before going into the field, the questionnaire was tested by using Cronbach's alpha to find the reliability of the tool. According to Taherdoost (2016), a Cronbach's alpha of .70 is a minimum recommendation to indicate that the items are reliably constructed. For the present study, the Cronbach's

alpha was .66, which is close to the recommended 0.70, indicating that the constructs were reliable.

After testing, the questionnaire was distributed to the 413 academic staff in the four universities according to the sampling frame in Table 1, and 292 questionnaires were filled in correctly and returned, resulting in a return rate of 78.5%. These questionnaires were used for the analysis.

The qualitative data was collected by using the questionnaires from the 14 key informants (six heads of department, four ICT technicians and four library technicians). Documentary sources such as policy documents, existing literature on OAIRs, the Directory of Open Access Repositories (OpenDOAR, 2020) and the Registry of Open Access Repositories (ROAR) were used to collect qualitative data on the number of content items available in the OAIRs.

The quantitative data was analysed using the Statistical Package for the Social Sciences (SPSS), version 16. Descriptive statistics were calculated to generate frequencies and percentages. Inferential statistics were calculated by cross-tabulating the variables to generate p -values and determine the relationships among the variables and ascertain the presence or absence of any statistically significant difference in the results. The data obtained from the interview were presented in form of explanations according to themes related to the research questions.

Findings

Demographic characteristics of the respondents

Figure 2 shows that 60.3% of the respondents were male and 39.7% were female.

Figure 3 presents the age of the respondents. It shows that 37.7% of the respondents were aged between 36 and 45, and 4.8% of the respondents were 61 and above in all four universities.

Figure 4 presents the academic qualifications of the respondents. It shows that 45.5% of the respondents had a Master's degree, 33.6% a PhD, 19.5% a Bachelor's degree and 1.4% a postgraduate diploma.

Table 2 shows that most of the respondents at MUHAS (44.9%) had 1–5 years of work experience. At MU, 30.7% of the respondents had 11–15 years of work experience; at SUA, 18.7% had 11–15 years of work experience and at the UDSM, 44.0% had 11–15 years of work experience. This shows that many of the respondents had work experience of 1–15 years.

Table 3 shows the research disciplines of the respondents. For the discipline of pure sciences, 27.9% of the respondents were from MUHAS. For the field of social sciences, 33.3% were from MU, 17.3% were from SUA and 37.0% were from the UDSM.

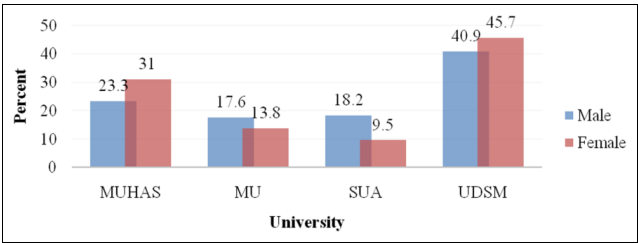


Figure 2. Distribution of the respondents by sex (n = 292).

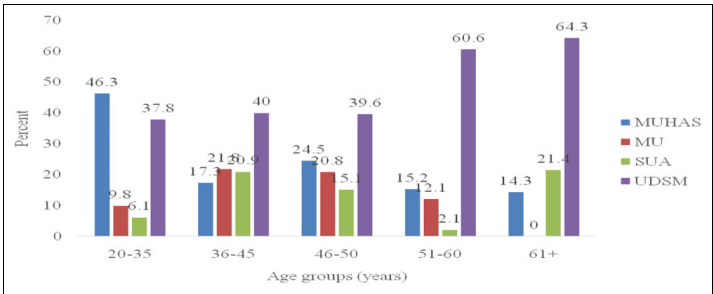


Figure 3. Age of the respondents (n = 292).

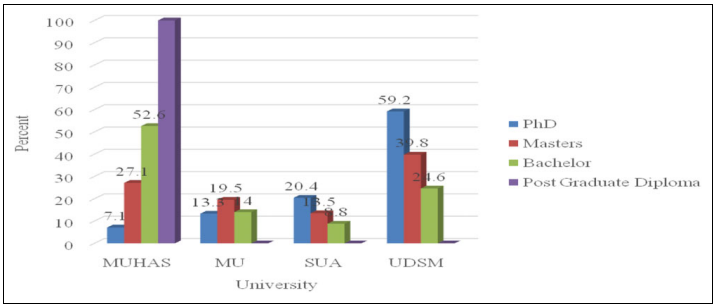


Figure 4. Academic qualifications of the respondents (n = 292).

Awareness of the presence of OAIRs

The study sought to confirm if academic staff were aware of the presence of OAIRs in their universities. Table 4 shows the respondents' awareness of OAIRs in their universities. The results show that 92.5%

of the respondents were aware of the existence of OAIRs.

Table 5 shows awareness of the presence of OAIRs by academic qualifications of the respondents. The results show that 46% of those with a Master's degree

Table 2. Work experience (years) of the respondents ($n = 292$).

Variable	University							
	MUHAS		MU		SUA		UDSM	
	F	%	F	%	F	%	F	%
Work experience (years)								
1–5	35	44.9	7	9.0	5	6.4	31	39.7
6–10	17	25.0	12	17.6	10	14.7	29	42.6
11–15	5	6.7	23	30.7	14	18.7	33	44.0
16–20	11	30.6	5	13.9	5	13.9	15	41.7
21–25	6	35.3	0	0.0	3	17.6	8	47.1
26+	3	16.7	0	0.0	6	33.3	9	50.0

Table 3. Research disciplines of the respondents ($n = 292$).

Variable	University							
	MUHAS		MU		SUA		UDSM	
	F	%	F	%	F	%	F	%
Research discipline								
Pure sciences	12	27.9	4	9.3	6	14.0	21	48.8
Social sciences	10	12.3	27	33.3	14	17.3	30	37.0
Law	3	15.8	7	36.8	2	10.5	7	36.8
Economics	5	29.4	3	17.6	0	0.0	9	52.9
Education	3	10.3	1	3.4	2	6.9	23	79.3
Medicine	2	25.0	2	25.0	0	0.0	4	50.0
Engineering	1	3.7	2	7.4	0	0.0	24	88.9
Information and Communication Technology (ICT)	1	6.2	0	0.0	1	6.2	14	87.5
Librarianship	3	27.3	0	0.0	8	72.7	0	0.0

Table 4. Respondents' awareness of the presence of OAIRs ($n = 292$).

Awareness of the presence of OAIRs	F	%
Yes	270	92.5
No	21	7.2
Don't know	1	0.3
Total	292	100

Table 5. Awareness of the presence of OAIRs by respondents' academic qualifications ($n = 270$).

Highest academic qualification	F	%	p
PhD	90	33	.909
Master's degree	124	46	
Bachelor's degree	52	19	
Postgraduate diploma	4	1	
Total	270	100	

were aware of the existence of OAIRs in their institutions, followed by 33% of those with a PhD, 19% of those with a Bachelor's degree and 1% of those with a postgraduate diploma.

Table 6. Awareness of the presence of university OAIRs by respondents' work experience (years) ($n = 270$).

Work experience (years)	F	%	p
1–5	71	26.3	.607
6–10	59	21.9	
11–15	72	26.7	
16–20	35	13.0	
21–25	16	5.9	
26+	17	6.3	
Total	270	100	

Table 6 shows awareness of the existence of OAIRs by work experience of the respondents. The results show that those with work experience of 1–20 years were more aware of the presence of OAIRs in their institutions (87.9%) than those with work experience of 20 and above years (12.2%). However, it also shows that awareness is not statistically significant across the demographic profiles of the respondents.

Table 7 shows awareness of the presence of OAIRs by the research disciplines of the respondents. The results show that 28.1% of the academic members

Table 7. Awareness of the presence of OAIRs by respondents' research disciplines ($n = 270$).

Research discipline	F	%
Agriculture	21	7.8
Pure sciences	37	13.7
Social sciences	76	28.1
Law	17	6.0
Economics, accountancy and finance	16	6.0
Education	27	10.0
Medicine	8	3.0
Engineering	26	10.0
Information and Communication Technology (ICT)	12	4.4
Librarianship	11	4.0
Not applicable	19	7.0
Total	270	100

Table 8. Academic staff who self-archived their locally produced research content in OAIRs ($N = 135$).

University	Yes		No	
	F	%	F	%
MUHAS	44	15.1	33	11.3
MU	24	8.2	23	7.9
SUA	29	9.3	14	4.8
UDSM	38	13.0	87	29.8
Total	135	46.2	157	53.8

of staff in the social sciences were aware of the presence of OAIRs in their institutions. Moreover, 13.7% of those in the pure sciences, 10.0% of those in education and 10.0% of those in engineering were aware of the existence of OAIRs. The level of awareness was less than 10.0% for the other disciplines.

Engagement of academic staff in self-archiving of locally produced content in OAIRs

The study sought to find out if academic staff self-archived their academic work in university OAIRs. Table 8 shows the number of staff who self-archived their locally produced research content in OAIRs. The results show that 15.1% of the respondents from MUHAS, 13.0% from the UDSM, 9.3% from SUA and 8.2% from MU self-archived the content they produced.

This was found by researcher during the interview with some key informants. For example, one of the key informants from SUA commented. For example, one of the key informants from SUA commented: 'Generally, academic staff do not self-archive their academic work in OAIRs; most of academic staff started to selfarchive their work when the university

Table 9. Personnel who assisted in self-archiving locally produced content in university OAIRs ($n = 135$).

Personnel	F	%
No assistance	46	15.8
Library staff	57	19.2
Colleague	13	4.5
ICT technician	13	4.5
Library technician	6	2.1
Total	135	46.2

Table 10. Self-archived locally produced content by academic qualifications of the respondents ($n = 135$).

Highest academic qualification	F	%
PhD	53	18.2
Master's degree	54	18.4
Bachelor's degree	27	9.2
Postgraduate diploma	1	0.3
Total	135	46.2

imposed the mandate policy to deposit academic works in the university's OAIRs'.

The study also sought to determine the sources of assistance for self-archiving among the academic members of staff. Table 9 shows the personnel who assisted in self-archiving locally produced content in university OAIRs. The results show that library staff (19.2%), colleagues (4.5%), ICT technicians (4.5%) and library technicians (2.1%) were the personnel who assisted in the self-archiving of locally produced content in the university OAIRs; however, 15.8% of the academic members of staff reported to self-archived their locally produced research output in the university OAIRs without requesting any assistance.

This was found by researcher during the interview with some key informants. For example, one of the respondents from MU commented: 'Library staff are the ones who self-archive academic works in OAIRs'.

Table 10 shows the number of locally produced content items that were self-archived in OAIRs by the academic qualifications of the respondents. The results show that those with a Master's degree (18.4%) and PhD (18.2%) had self-archived more documents than those with a Bachelor's degree (9.2%) or postgraduate diploma (0.3%).

Table 11 shows the number of locally produced content items that were self-archived in OAIRs by the work experience of the respondents. The results show that those with work experience of 11–15 years had self-archived more content than the others.

This was found by researcher during the interview with some key informants. For example, respondents

Table 11. Self-archived locally produced content by work experience of the respondents ($n = 135$).

Work experience (years)	F	%
1–5	25	8.6
6–10	27	9.2
11–15	38	13.0
16–20	20	6.8
21–25	11	3.8
26+	14	4.8
Total	135	46.2

Table 12. Self-archived locally produced content by research disciplines of the respondents ($n = 135$).

Research disciplines	F	%
Agriculture	8	2.7
Pure sciences	20	6.8
Social sciences	35	12.0
Law	10	3.4
Economics, accountancy and finance	6	2.1
Education	10	3.4
Medicine	4	1.4
Engineering	14	4.8
Information and Communication Technology (ICT)	6	2.1
Librarianship	10	3.4
Not applicable	12	4.1
Total	135	46.2

from SUA and the UDSM commented along the lines of: ‘Academic staff who have more work experience archive or deposit more local content themselves in OAIRs’.

Table 12 shows the number of locally produced content items that were self-archived in OAIRs by the research disciplines of the respondents. The results show that there were more self-archived documents from the following disciplines: social sciences (12.0%), pure sciences (6.8%), engineering (4.8%), education (3.4%), librarianship (3.4%) and agriculture (2.7%).

Categories of locally produced content self-archived in OAIRs by academic staff

The study sought to find out which categories of locally produced content were self-archived in OAIRs. Table 13 shows the categories of the documents that were self-archived in OAIRs. The results show that the categories that were self-archived the most were journal articles (21.6%), research reports (17.5%), dissertations (10.6%) and theses (10.0%).

This was found by researcher during the interview with some key informants. For example, respondents

Table 13. Self-archived locally produced content by category ($n = 135$).

Categories	F	%
Journal article	63	21.6
Research report	51	17.5
Book chapter	15	5.1
Thesis	29	10.0
Conference paper	18	6.2
Dissertation	31	10.6
Lecture notes	1	0.3

Note. This was a multiple-response question.

Table 14. Sources of skills for self-archiving academic work in OAIRs ($n = 135$).

Sources of skills	F	%
Library	45	15.4
Seminars/workshops	39	13.4
Colleagues	26	9.0
OAIR guides	25	8.6
Total	135	46.6

from MUHAS and the UDSM commented along the lines of: ‘academic staff are only allowed to self-archive local content in the form of abstracts in the OAIR’.

Sources of skills for self-archiving academic work in OAIRs

The study sought to find out where academic staff obtained the skills of self-archiving documents in OAIRs. Table 14 shows the sources of the skills for self-archiving academic work in OAIRs. The results show that 15.4% of the respondents indicated that they obtained their skills from the library, 13.4% obtained them from seminars and workshops, 9.0% from colleagues and 8.6% from OAIR guides.

This was found by researcher during the interview with some key informants. For example, the respondents from SUA, MU, the UDSM and MUHAS commented along the lines of: ‘The majority of academic staff obtain their skills from the library and library staff through training and seminars, and from guidelines that are available on the library’s website’.

Challenges in self-archiving locally produced content in university OAIRs

The study sought to determine the challenges encountered by academic staff when self-archiving their locally produced content in university OAIRs.

Table 15. Challenges encountered during self-archiving of locally produced content in university OAIRs ($n = 135$).

Variables	F	%
Philosophical and personal values		
Copyright issues	18	6.2
No work to deposit	15	5.1
Technical factors		
Slow Internet connectivity and low bandwidth	50	17.1
Outdated version of DSpace	7	2.4
Technical problems like an error on the server	5	1.7
The interface of the institutional repository is difficult to recognize	4	1.4
Difficulties converting Word documents to PDF format	4	1.4
Unstable power supply	12	4.1
Competency		
Time-consuming	6	2.1
Conflicting with other university activities	5	1.7
Lack of knowledge and skills	4	1.4
Uploading procedure is not user-friendly	5	1.7
Total	135	46.3

Table 15 shows the challenges encountered during self-archiving locally produced content in university OAIRs. The results indicate that most of the challenges were technical in nature. It is shown that 17.1% of the respondents indicated that slow Internet connectivity and low bandwidth were the big challenges encountered during self-archiving their locally produced content in university OAIRs. The other challenges were categorized as philosophical and personal values, such as copyright issues (6.2%) and having no work to deposit (5.1%), or competency issues, such as it being a time-consuming process (2.1%), it conflicting with other university activities (1.7%), non-user-friendly uploading procedures (1.7%), and a lack of knowledge and skills (1.4%).

This was found by researcher during the interview with some key informants. For example, a respondent from MU remarked: 'Slow Internet connectivity is a major problem when self-archiving locally produced content in the university OAIR. Other challenges are the lack of skills and an inadequate number of library staff'.

Strategies to improve the involvement of academic staff in self-archiving locally produced content in university OAIRs

The study also established strategies that can help to improve the involvement of academic staff in self-archiving their locally produced content in university OAIRs. Table 16 shows the suggested strategies. The

Table 16. Suggested strategies to improve the involvement of academic staff in self-archiving their locally produced content in university OAIRs ($n = 135$).

Strategies	F	%
Motivate staff to deposit content	15	5.1
Availability of ICT facilities	20	6.8
Enforce regulations and mandatory follow-up of OAIR policy	12	4.1
International recognition	2	0.7
Create awareness	40	13.7
Conduct training and seminars or workshops	25	8.6
Add updated content	1	0.3
Deposit should be mandatory	1	0.3
Easy access	4	1.4
Encourage publishers to share their work	5	1.7
Provide research funds	8	2.7
Register more OAIR users who can upload content	1	0.3
Other	1	0.3
Total	135	46.0

results indicate that creating awareness (13.7%), conducting training and seminars or workshops (8.6%), the availability of ICT facilities (6.8%), staff motivation (5.1%), enforcing regulations and mandatory follow-up of OAIR policy (4.1%), and providing research funds (2.7%) would be useful strategies to improve the involvement of academic staff in self-archiving their locally produced content in university OAIRs.

This was found by researcher during the interview with some key informants. For example, the respondents from MU, SUA, MUHAS and the UDSM commented along the lines of:

The strategies that can be used to improve the depositing of local content in OAIRs are improving Internet facilities and bandwidth. Also, universities and libraries should promote OAIR awareness and reward those academic staff with more publications in OAIRs, and libraries should buy large servers to prevent the disappearance of content that has been deposited.

Discussion

Demographics of the respondents

The study found that the majority of the respondents were young academic staff who were well educated and experienced researchers. This implies that this is a crucial group, which is expected to be engaged in self-archiving locally produced content in university OAIRs. Therefore, universities and other academic

organizations should encourage academic staff to deposit or self-archive their academic work in OAIRs.

Level of awareness of the presence of OAIRs

This study's findings reveal that the respondents in these four universities in Tanzania were aware of the presence of OAIRs, and some of them indicated that they had self-archived or deposited their academic work in OAIRs. This implies that there has been an improvement in academic staff's awareness of the presence of OAIRs in Tanzanian universities compared to the findings reported in previous studies (Dulle and Minishi-Majanja, 2011; Lwoga and Questier, 2014; Muneja, 2010). In fact, without full awareness of the existence of OAIRs, the self-archiving of local content may not be realized.

Also, the study investigated awareness of the presence of OAIRs by gender. The results reveal that male academic staff were more aware of OAIRs than female academic staff. This implies that men are better adopters and users of technology and electronic resources than women. This is supported by the studies conducted and Goswami and Dutta (2016). Therefore, there should be more deliberate efforts to create awareness among female academic staff by offering workshops, training and seminars to these staff members.

However, the results show that academic staff in the age between 20 and 50, respondents with high-level academic qualifications and work experience, and respondents in the social sciences research discipline were more aware of the presence of OAIRs in the university. This implies that junior academic staff are more eager to try out new technologies and innovations than the older age group. This is supported by Alemayehu (2010) and Oguz and Assefa (2014), who reveal that junior staff were more aware of the presence of OAIRs in universities. Also, in other universities, academic staff are aware of OAIRs because they are mandated by policy to deposit their theses and dissertations in the university OAIR after completing their studies. Therefore, there should be more deliberate efforts to create awareness among the older age group of academic staff by conducting workshops, training and seminars for these staff members.

Engagement of academic staff in depositing locally produced content in OAIRs

The findings show that the majority of academic staff were not very engaged in depositing or self-archiving their locally produced content in university OAIRs. This implies that academic staff are not aware of the process and procedure of self-archiving or depositing

local content in OAIRs, and the reasons for this include conflicts with other university activities, copyright issues, insufficient digital content to deposit, and a lack of knowledge and skills. It is discouraging to find that academic staff, who are the major contributors to OAIRs, are not self-archiving local content in their universities' OAIRs. Therefore, awareness campaigns, workshops and seminars could be a practical means to inform academic staff about the benefits of depositing their research output in university OAIRs. Also, strategies to eliminate the challenges to self-archiving should be implemented.

On the other hand, the study found that the self-archiving of locally produced content in OAIRs was influenced by academic qualifications and work experience. This implies that those with a PhD or Master's degree, and those with more years of work experience, self-archived more than the other academic staff members. This is because they have theses, dissertations, research reports and journal articles to deposit in OAIRs after they have completed their studies. They also have more experience in research and opportunities to secure more funds for research than those who have relatively few years of work experience in their institutions. This is supported by Dulle and Minishi-Majanja's (2011) study, which notes that male respondents were more likely to publish in open access outlets than female respondents. Also, Eger et al. (2015) and Lwoga and Questier (2014) found that maturity was associated with greater participation, and Dulle (2010) found that older researchers were expected to have attained high qualifications and accumulated more research experience. Therefore, for all groups to be engaged in depositing local content in OAIRs, they should be provided with enough research training and opportunities to secure funds for research.

The study also investigated the categories of documents that were deposited. It was found that journal articles, research output, dissertations and theses were the categories of documents that were deposited most in OAIRs. This implies that these documents are deposited more often and preferable for most academic staff. This is supported by Lippincott's (2006) and Siegel's (2010) studies, which indicate that electronic theses and dissertations were being frequently deposited in OAIRs, and Nunda and Elia's (2019) research, which found that the preferred categories deposited in OAIRs were theses or dissertations, journal articles, conference papers and seminar papers. Therefore, more emphasis should be placed on the fact that all locally created academic work should be deposited in OAIRs.

In addition, the study investigated where academic staff obtained the skills to deposit local content. It is implied that only library staff are encouraging academic staff to deposit their academic work in university OAIRs. This is because library staff are the custodians of OAIRs, possess the necessary skills and are more expert than other groups. Therefore, provide training sessions to librarians and member of academic staff and also the university should link f the institutional repository to the university and faculties' websites.

Challenges in depositing locally produced content in university OAIRs

The study found that slow Internet connectivity and low bandwidth were big challenges encountered during the depositing of local content in university OAIRs. These are common challenges that hinder the depositing of local content in OAIRs in most universities across Africa, especially Tanzania. This is supported by Eromosele's (2019) and Ivwighrehweta's (2012) studies, which indicate that if the technological facilities associated with OAIRs are designed in a way that is perceived as easy to use by academic staff in the university, there are opportunities to motivate and hence improve staff engagement in depositing local content in OAIRs in Tanzanian universities. Therefore, it is important to ensure the availability of good Internet connectivity and sufficient bandwidth.

Implications of the conceptual framework of the study

The study found that several assumptions which are implied in the quadratic usage framework have been supported. For instance, the study found that academic staff were not able to follow the procedures on how to deposit their locally produced content in OAIRs as a technology. The second element was competence, which is the knowledge and skills necessary to operate that technology. The study found that many challenges lay in the third element, cultural value, which is related to policy, values, beliefs, culture, voluntariness and social influences. These were also found to be influential in self-archiving locally produced content in OAIRs. The fourth element, personal value, was found to have an influence on users' attitude towards participation in self-archiving locally produced content in OAIRs. For example, motivation, intention, desire, pleasure, enjoyment, fulfilment, anxiety and all of the other challenges that distinguish one user from another and the user from their environment were found to have a link to individual users' motivation and choice.

Conclusion

It can be concluded that the engagement of academic staff in self-archiving locally produced content in university OAIRs is very important. The self-archiving of locally produced content in OAIRs provides knowledge to the university community, satisfies local information needs, enhances free community access to content, and increases the visibility of the university. Low engagement in self-archiving locally produced content will lead to a lack of content and low university visibility. It is necessary for universities and academic libraries to continue to encourage academic staff to self-archive their locally produced content in OAIRs. If we cannot encourage academic staff to self-archive, our OAIRs will be of no use.

Recommendations

Based on the findings and discussion above, this study offers some recommendations. First, it was found that many academic staff were aware of the presence of OAIRs in their universities but only a few of them engaged in self-archiving. Therefore, universities and other academic organizations should encourage academic staff to use OAIRs to self-archive their academic work.

The findings indicate that many academic staff were not aware of the benefits that may be obtained when they self-archive their output in OAIRs. Consequently, universities and other academic organizations should inform academic staff of the practical benefits of depositing their research output in university OAIRs. Moreover, it was found that many universities do not provide incentives for academic staff who self-archive their locally produced content in OAIRs. Universities and other academic organizations should therefore make sure that they provide academic staff with enough research funds and opportunities for securing funds for research.

Furthermore, the findings indicate that some publishers do not give prompt feedback to academic staff when they send their manuscripts for publication. Publishers should be advised to give quick feedback and make swift decisions so as to motivate academic staff who are aiming to publish locally produced output that can also serve as material for self-archiving.

It was revealed that there are no training sessions on how to self-archive content in OAIRs. Universities and other academic organizations should provide regular training sessions to members of academic staff on how to upload local content in OAIRs. Lastly, many academic staff stated that slow Internet speed was a big challenge when they self-archived articles. Universities and other academic organizations should

ensure the availability of good Internet connectivity by increasing the bandwidth, which will motivate staff to use OAIRs.

Contributions of the study to the scientific community

This study contributes to the body of knowledge around self-archiving local content using OAIRs. It has offered pertinent recommendations which, if adopted by universities, will enhance the self-archiving of locally produced content and hence increase the visibility and usage of that content.

Areas for further study

There is a need to carry out a further in-depth study to explore additional incentives that may be offered to academic staff to intensify their efforts and attitude towards self-archiving in established OAIRs.

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3.0 CHAPTER THREE

Self-archiving of Scholarly Publications for improved access
to local content in Tanzania: A study of Open Access
Institutional Repositories in Universities in Tanzania

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Self-archiving of Scholarly Publications for improved access to local content in Tanzania: A study of Open Access Institutional Repositories in Universities in Tanzania

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Abstract

This study sought to investigate how the self-archiving of scholarly publications in Open Access Institutional Repositories can be strengthened for improved access to local content. Specifically, the study sought to investigate factors that influence self-archiving of scholarly publications in OAIRs, examine the implementation of OAIRs policies on self-archiving of scholarly publications in OAIRs and determine challenges that hinder self-archiving of scholarly publications in OAIRs. The population of the study consisted of 2894 faculty members and 413 sample size, obtained through a systematic random sampling technique. Data were collected using questionnaires and interviews with eight key informants. Key findings indicated that there are factors that influenced self-archiving of scholarly publications in OAIRs among faculty members such motivating factors, availability of technical support, supervisors/peers/colleagues and supporting services. Moreover, the study found challenges that hindered self-archiving as low level of awareness and inadequate advocacy for a self-archiving, lack of personal benefit such as rewards and promotions, fear of the plagiarism, lack of enough facilities like ICT and internet connectivity. The study also found that there was a need to implement OAIR policies in self-archiving of scholarly publications in the OAIRs. In order to strengthen self-archiving, the study recommends providing support services, technical supports, encouraging supervisors/peers/colleagues, creating awareness, providing personal benefits, provide education and give more time, effort and implement OAIR policies to enhance the process of self-archiving scholarly publications in OAIRs. The findings of this study shall contribute new knowledge to the existing research outputs that have been conducted in this field.

Keywords

Faculty members, scholarly publications, self-archiving, Open Access Institutional Repository (OAIRs), Universities, Tanzania

Introduction

Open Access Institutional Repositories (OAIRs) are very important in institutions as they provide access to scholarly publications produced by faculty members. OAIRs are digital archive that preserve and disseminate free copies of the scholarly publications of an institution to users inside and outside. Scholarly publication may include:

journal articles, theses and dissertations, administrative documents, course notes, and learning objects (Gunasekera, 2018).

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OAIRs have been spread around the world since the early 2000s. The first OAIR emerged in Europe then followed by other countries including: North and South America, Japan, India, and Australia (Sang et al., 2021). In Africa, the first OAIRs emerged in South Africa in 2006. South Africa is the first country to have more OAIRs compared to other African countries (Chilimo, 2016; Karanja, 2017). In East Africa, the first OAIRs emerged in Kenya in 2010. According to the Directory of Open Access Repositories (2022), there are 71 OAIRs registered in East Africa comprising of 44 OAIRs from Kenya, 14 from Tanzania, and 13 from Uganda. Borrego (2017) was of the view that the world's OAIRs are still growing and there are a small number of large OAIRs with more than a million items and a large number of small OAIRs with deposited items ranging between 100 and 100,000 documents.

OAIRs were adopted to offer the opportunity for institutions to collect and preserve scholarly publications of the university, provide open access to outputs of the institution to a worldwide audience, to create globally visibility of the university's scholarly publications, to serve as an alternative channels for scholarly communication as well as to serve as the publication database of an institution (Bojelo, 2020; Malekani and Kavishe, 2018; Saini, 2018; Sang et al., 2021).

OAIRs in the university cannot fulfill the purpose for which they were established if they are not populated with. Initially, scholarly publications were collected and preserved in the university OAIRs by librarians (Saini, 2018). Librarians were the ones who requested for publications from faculties to upload them to OAIRs (Saini, 2018). However, depositing of contents in the university OAIRs require concerted effort because librarians cannot manage to identify, acquire and upload all publications produced by faculty members. Different studies argue that faculty members and researchers should deposit or self-archive their own work pre-or post-peer review (Kim, 2011; Lynch, 2003:12).

When depositing of research outputs in the OAIRs is done by the author of a publication it is known as self-archiving (Nakitare and Chege, 2017). Self-archiving is when an act of the author posts a work of theirs online in order to ensure that it is free available to the user community (Mwalubanda, 2021). Self-archiving has been noted to be for the purpose of maximizing accessibility, usage and citation of author's publications and the visibility of the university at large (Nakitare and Chege, 2017). Although the self-archiving has been noted to be very important, researchers are still reluctant to self-archive their work in OAIRs (Tmava, 2022).

Different studies done on the attitude of faculty members toward self-archiving confirmed that self-archiving was not done by faculty members in the universities. In Europe, van Westrienen and Lynch (2005) reported a European case that even though the libraries created OAIRs as useful avenue to deposit, faculty members were

often reluctant to take advantage of the OAIRs by self-archiving their intellectual research content. In Malaysia, Singeh et al. (2013) observed that although academic researchers tended to agree that OAIRs were a good way of disseminating their research, most of them have not fully embraced self-archiving in OAIRs.

In Southern Africa, M'kulama et al. (2020), observed that LIS professionals from Zambia were aware and knowledgeable about self-archiving and considered it as important channel for increasing research visibility and impact. However, despite being aware and knowledgeable of self-archiving, it was not widely practice as expected. Similarly, in East Africa, Chilimo (2016) in his study found a low rate of self-archiving among academic researchers in selected public universities in Kenya.

As reported by Kayungi and Manda (2021), Mbughuni et al. (2022), and Nunda and Elia (2019), academic researchers in Tanzania have not adequately done self-archiving of their scholar publications. Worldwide, different studies have shown that self-archiving is one of the biggest challenges of operating OAIRs. Therefore, the study is also done in selected higher learning institutions in Tanzania to investigate factors influencing self-archiving of scholarly publications in OAIRs among faculty members.

Statement of the problem

Self-archiving is promising to increase visibility of articles and sharing of scholarly publications among researchers (Baro et al., 2018). Despite the advantages obtained through self-archiving, academic staff have yet to be committed to self-archiving their scholarly publications in their university OAIRs (Chirwa and Mnzava, 2017; Dulle et al., 2010; Kayungi and Manda, 2021; Lwoga and Questier, 2014; Malekani and Kavishe, 2018; Raphael and Edda, 2017). As a result of low number of scholarly publications uploaded in Tanzania university OAIRs, the visibility and accessibility of the scholarly publication of the university community has been poor. The rationale of this study therefore, was to investigate how self-archiving of scholarly publication in OAIRs could be strengthened for improved access to local content in Tanzania.

Main objective of the study

The main objective of this study was to investigate how self-archiving of scholarly publications in OAIRs can be strengthened for improved access to local contents in Tanzania. Specifically, the study sought to;

- (i) Investigate the factors that influence self-archiving of scholarly publications in OAIRs.
- (ii) Examine the implementation of OAIRs policies on self-archiving of scholarly publications.

- (iii) To identify the challenges that hinder self-archiving of scholarly publications in OAIRs.

Research questions

- (i) What are the factors that influence self-archiving of scholarly publications in OAIRs?
- (ii) Are the OAIRs policies implemented to improve self-archiving of scholarly publications?
- (iv) What are the challenges that hinder self-archiving of scholarly publications in OAIRs?

Literature review

Literature was reviewed according to the specific objective of the study; that is, the factors influence self-archiving of scholarly publications in OAIRs, the implementation of OAIRs policies on self-archiving of scholarly publications in OAIRs and challenges that hinder self-archiving of scholarly publications in OAIRs.

Factors that influence self-archiving of scholarly publications in OAIRs

Several studies have provided evidence that there are factors that influence self-archiving of scholarly publications in OAIRs, and noted that these factors could be positive or negative (Baro et al., 2018; Kakai, 2018). In Sri Lanka and Ghana, studies found out that there are positive factors which motivate faculty members to self-archive their scholarly publications in OAIRs. These factors include faculty members finding self-archiving as a good way of disseminating academic work and OAIRs serving as a permanent place for the availability of academic works. Also, self-archiving supports the principle of open access and they wished to be involved with technology and would like to get feedback or commentary from others (Bamigbola and Adetimirin, 2018; Gunasekera, 2018).

In Nigeria studies found that faculty members are motivated to self-archive because they want to increase exposure to previously published work, get exposure to works not previously published, broaden the dissemination of their academic research, increase institutions visibility and tenure and promotion prospects. They also self-archive because they want to contribute their knowledge, support access policy, and satisfy the need for creativity/curiosity for the subject field, and gain funding/financial reward (Baro et al., 2018; Musa, 2016; Okeji et al., 2019). Therefore, for academic staff to self-archive in the university OAIRs there should be factors that positively motivate them to self-archive.

There are also factors that support faculty members to self-archive scholarly publications in OAIRs. Availability

of these supporting factors enable faculty members to self-archive their scholarly publications in university OAIRs. These supporting factors include the availability of ICTs infrastructures or technical support. The ICTs infrastructures includes Internet and WWW, high-resolution capture devices, high capacity digital storage media, multi-faceted search engines, the fast processing power of the computer, dropping computer costs, and increased bandwidth network (Gupta, 2016). The technical supports could be an ICT technician or librarian who can provide consistent technical support to faculty members when self-archiving their articles in OAIRs (M'kulama et al., 2020).

Mwalubanda (2021) and Idiegbeyan-ose et al. (2020), argue that for proper self-archiving of scholarly publication in OAIRs among faculty members needs technical supports such as the availability of ICT personnel or unit providing technical support to assist faculty members with difficulties during self-archiving. Therefore, supporting services are very important if the university needs to promote self-archiving among faculty members.

Implementation of OAIRs policies on self-archiving of scholarly publications in OAIRs

Self-archiving is a very important task that involves faculty members depositing their scholarly publications in OAIRs. Different studies conducted on faculty attitude toward self-archiving, found out that the majority of faculty members are not self-archiving their scholarly publications in OAIRs.

Due to the challenges of self-archiving, several universities decided to formulate OAIRs policies to enhance self-archiving among faculty members. According to Musa (2016) faculty members have a very low level of motivation to self-archive their scholarly publications in OAIRs. This created the need for OAIRs policy to make them self-archive their scholarly publications in university OAIRs. The OAIRs policy formulated is a submission policy that mandates faculty members to deposit their scholarly publications (Kakai, 2018). For example, a study conducted by M'kulama et al. (2020) revealed that implementing a mandatory policy for self-archiving of all research publications would influence attitude toward self-archiving of scholarly publications in OAIRs among faculty members in the universities. Morrison et al. (2020) revealed that formulating OAIRs policy would create an understanding of publisher license clauses and copyright issues which would yield a better result on the rate of self-archiving scholarly publications among faculty members.

Others studies (Baro et al., 2018; Mwalubanda, 2021; Sajitha and Majeed, 2019) argued for formulating a submission policy for guiding members of staff to submit their research outputs to the repository and, establish a reward system for academic staff members who submit their works to the institutional repository.

The implementation of OAIRs self-archiving policies especially self-archiving mandate policies encouraged faculty members to self-archive and as a result, they benefited from increased citation rate and being visible on the internet (Musa, 2016). On the contrary, however Ukachi (2018) found out that OAIRs the process of imposing OAIRs policies it by institutions or funding bodies is a not motivates faculty members to self-archive their papers.

Challenges that hinder self-archiving of scholarly publications in OAIRs

There are a number of factors that have been established as challenges that hinder faculty members from self-archiving their scholarly publications in OAIRs. These factors include fear of copyright infringement, lower level of and/or lack of awareness, fear of plagiarism, the belief that depositing work in the IR might hinder them from publishing elsewhere later, lack of institutional policies and perception that IR content are of low quality (Chirwa and Mnzava, 2017; Lee et al., 2019; Musa, 2016; Tmava, 2022).

According to Kayungi and Manda (2021), lack of adequate awareness about (IRs) in general was the major challenge that limited academic staff from enjoying the benefit of using IRs in the universities. Despite these challenges depositing of scholarly publications by academics through self-archiving was noted to be very important activity for the success of OAIRs.

Theoretical framework and conceptual framework

Various studies were reviewed to identify a suitable theory/model to guide this study. There are a number of theories/models that focus on the adoption of information technology. These include: The theory of Diffusion of Innovation (DIT), The Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), The Technology Acceptance Model (TAM), Technology Acceptance Model 2 (TAM2), Unified Theory of Acceptance and Use of Technology (UTAUT) Model and Technology Acceptance Model 3 (TAM3). Since OAIRs are considered as technological systems, some of the theories on technology acceptance and adoption may be used to guide this study in predicting the factors that influence self-archiving of scholarly publications in OAIRs in Tanzania.

This study was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh and Davis, 2000). This model was used because it is widely used in the information communication technology industry to explain factors that influence users' behavior in terms of acceptance of technology (Saulus, 2017). The UTAUT theory model suggests that adopting technology is dependent on the direct effect of four key

constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. The effect of predictors is moderated by age, gender, experience, and voluntariness of use (Venkatesh et al., 2003).

According to Venkatesh et al. (2003), the UTAUT variable were explained as follows: Performance expectancy means the degree to which an individual believes using the system will help him or her to attain gains in job performance. Effort expectancy means the degree of ease associated with the use of the system. Social influence means the degree to which an individual perceives that important people believe he or she should use the system. Facilitating conditions means the extent to which an individual believes that an organization and technical infrastructure exists to support the use of the system. The moderators (age, gender, experience, and voluntariness of use) were also moderate the strength of predictors on intention. Age moderates the effect of all four predictors. Gender affects the relationships between effort expectancy, performance expectancy, and social influence. Experience moderates the strength of the relationships between effort expectancy, social influence, and facilitating conditions. Voluntariness of use has a moderating effect only on the relationship between social influence and behavioral intention.

The conceptual framework was formulated by modifying other UTAUT variables. The study introduced some variables to improve the model to enhance the explanatory ability of the model. Therefore, in this study, the modified model retains the four and introduces one new moderator namely level of education. The independent variables were motivating factors, availability of technical supports, influence of colleague and supervisors and supporting needed that affected the behavior intention to self-archive scholarly publications in OAIRs and self-archiving of scholarly publications in OAIRs.

The dependent variable is the improved access to local contents and moderators are age, gender, experience, and level of education which have a direct or indirect effect on the self-archiving of scholarly publications in OAIRs. In the case of the moderators, voluntariness was replaced with the level of education because the level of education is expected to be a very important variable in the ability to self-archive in OAIRs. The model is therefore modified and expanded (Figure 1).

Methodology

The study adopted a cross-sectional research design. The design was selected because data can be collected at single point in time and suitable for estimating the prevalence of a behavior in a population (Sedgwick, 2014).

The study was conducted at four selected public universities in Tanzania namely: Muhimbili University of Health and Allied Sciences (MUHAS), Mzumbe University (MU), Sokoine University of Agriculture (SUA), and the

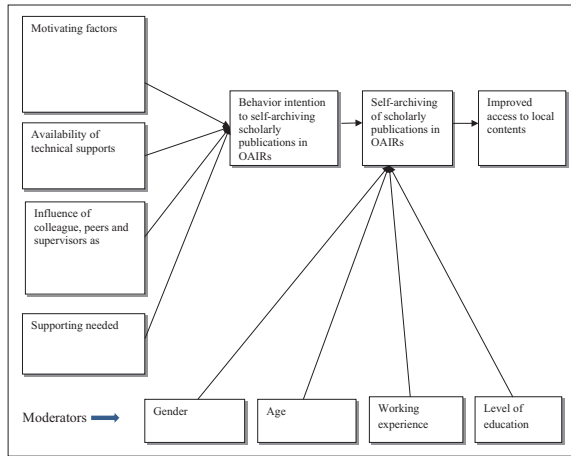


Figure 1. Modified from UTAUT (Venkatesh et al., 2003).

University of Dar es Salaam (UDSM). The study institutions were selected because these institutions have OAIRs and were among the first ones in Tanzania to establish OAIRs in the 1990s and their OAIRs are registered by the Open Directory of Open Access Institutional Repository (OpenDOAR).

The population for this study was 2894 faculty members. The sample size was obtained by using the Slovin's formula:

$$n = N / (1 + Ne^2)$$

Where "n" is the sample size

"N" is the total population (2894)

"e" is the margin of error (0.05).

Therefore:

$$2894 / (1 + 2894 \times 0.052) = 2895 / 2895 \times 0.0025 = 2894 / 7 = 413.$$

Therefore, out of 413 faculty members 34 faculty members were drawn from MU, 219 from UDSM, 61 from SUA and 99 from MUHAS (Table 1).

The study used two sampling techniques: systematic random sampling and purposive sampling. To obtain representatives in each university, a systematic random sampling technique was used by picking sixth faculty members from the source list in the university. Systematic sampling was used because it is simple and reduces the risk of bias. Purposive sampling was used to obtain eight key informants. One head of department of library from each of four universities and one ICT or library technicians from each of the four universities were selected purposively. Key informants were selected purposively based on the ones who were involved in managing OAIRs in their universities.

These data were collected by using a structured questionnaire administered to 413 institutions' community members. Two hundred ninety-two questionnaires were

Table 1. Sampling frame.

University	Academic staff population (N)	Proportion from the required "n" (N/2894) × 413
MUHAS	693	99
MU (Main campus)	236	34
SUA (Only Main campus and SMC)	427	61
UDSM (Main campus)	1538	219
Total	2894	413

Source: Field Data (2020) .

Table 2. Respondents by the university ($n = 292$).

University	Frequency	Percent
MUHAS	77	26.4
MU	47	16.1
SUA	43	14.7
UDSM	125	42.8
Total	292	100.0

Source: Field Data (2020).

successfully and correctly filled and returned making a return rate of 70.7%. Out of 292 who return the questionnaire, 158 respondents indicated using scholarly publications archived in OAIRs.

These data were collected during the in-depth interviews with key informants (four heads of department of libraries, two ICT technicians, and two library technicians), documentary review, and observation was read expansively to get the right interpretation and understanding of what they implied concerning the topic of investigation. Key informants were thought to be knowledgeable and involved in managing OAIRs. Secondary data were collected by reading from documentary sources including;

- Universities OAIRs policies documents to get insights on policies guiding the usage of OAIRs,
- Existing literature on OAIRs policies to get it clear on how different policies from other institutions compare with those formulated by universities under study,
- The Directory of Open Access Repositories (OpenDOAR) to get statistics on the number of documents deposited in OAIRs, and
- The Registry of Open Access Repositories (ROAR) to get statistics on the number of documents deposited in OAIRs.

Data were analyzed according to the specific objectives. Quantitative data were analyzed by using SPSS software Version 22. Descriptive statistics were calculated to obtain frequencies and percentages for example Table 2. Furthermore, objectives number one to four were analyzed by using inferential statistics where data were cross-tabulated to generate p -values that were used to determine the relationships among variables and ascertain the presence or absence of any statistical significance difference among the variables compared. Qualitative data was analyzed by using content analysis. Data obtained from universities' OAIRs policies, existing literature on OAIRs usage, the Directory of Open Access Repositories (OpenDOAR), and the Registry of Open Access Repositories (ROAR) were prepared and organized, reviewed and explored, create initial codes, combined into themes. The obtained themes were categorized according

Table 3. Demographic characteristics of respondents.

Characteristics of Respondents	
Variable	Frequency (%)
Gender	
Male	176 (60.3)
Female	116 (39.7)
Age	
20–35	82 (28.1)
36–45	110 (37.7)
46–50	53 (18.2)
51–60	33 (11.3)
61 and above	14 (4.8)
Level of education	
PhD	98 (33.6)
Masters	133 (45.5)
Bachelor	57 (19.5)
Post Graduate Diploma	4 (1.4)
Working experience	
1–5	78 (26.7)
6–10	68 (23.3)
11–15	75 (25.7)
16–20	36 (12.3)
21–25	17 (5.8)
26 and above	18 (8.2)

Source: Field Data (2020).

to the specific objectives and research questions. The verbatim quotations from respondents' views were taken into consideration and placed under the respective themes. This means that the analysis followed a pattern that matched the methods before conclusions were drawn from the findings. This process was done through the content analysis approach and then presented by explanation.

Results

Out of 413 copies of questionnaire distributed to faculty members, a total of 292 copies were returned duly completed and found usable for this study. The findings were presented below:

Demographic characteristics of the respondents

Table 3 presents demographic characteristics of the respondents. The study results show that 60.3% of the respondents were males and 39.7% were females. The implication was that the majority of respondents were male faculty members. The age range of 36–45 years constituted the highest respondent with 110 (37.7%). The implication was that there was a high number of young faculty members. Furthermore, the results show that majority of the respondents had Master's Degrees (45.5%) and 26.7% had working experience of 1–5 years. The

Table 4. Motivating factors that influence self-archiving of scholarly publications in OAIRs (n = 135).

Statement	Yes	No	p-Value
Self-archiving is useful for academic career	94 (32.2%)	41 (14.1%)	0.516
Self-archiving scholarly publications increases the visibility of my work	109 (37.2%)	26 (8.9%)	0.235
Self-archiving of scholarly publications enables sharing with other scholars	111 (38%)	24 (8.2%)	0.344
Self-archiving ensures my scholarly publications are preserved for future use	106 (36.3%)	29 (10.0%)	0.242
Self-archiving of scholarly publications contributes toward my career advancement	94 (32.2%)	41 (14.0%)	0.493

Source: Field Data (2020).

implication was that respondents were well qualified and experienced researchers to had several publications to self-archive in the university's OAIRs.

Factors that influence self-archiving of scholarly publications in OAIRs

Motivating factors to self-archiving of scholarly publications in OAIRs. Table 4 presents the motivating factors that influence self-archiving of scholarly publications in OAIRs. Results show that the motivating factors that influenced self-archiving of scholarly publications in OAIRs among faculty members were: wanting to share their scholarly publications with other faculty members (38%), wanting to increase the visibility of their work (37.2%) and wanting to preserve their scholarly publications for future use (36.3%).

The results indicated that there was no statistically significant difference at a 5% level of significance ($p \geq 0.05$). The implication was that more motivation was needed for effective exploitation of self-archiving among faculty members.

On the other hand, qualitative findings indicated the motivating factors that influence self-archiving of scholarly publications in OAIRs. One key informant explained:

"Generally, most faculty members self-archive their scholarly publications, because they expect rewards, promotion, professional recognition, prestige and to be famous."

Technical supports needed for self-archiving scholarly publications in OAIRs. Table 5 presents the technical supports needed for self-archiving scholarly publications in OAIRs. Results show that faculty members indicate to self-archive their scholarly publications in OAIRs because librarians were available to provide guidance when they indicated interest in self-archiving their scholarly publications in the OAIRs (29.1%). Guidelines were available to support the self-archiving of scholarly publications in OAIRs (26.4%). Availability of technical personnel such as ICT technician or library technician or specific person (or group) was available to give guidance to self-archive in the OAIRs (24.7%). The procedure to self-archive is easy to follow (22.3%) and technical skills and knowledge makes self-archiving of scholarly publications in OAIRs easy (21.6%).

The availability of technical personnel such as ICT technicians or library technicians, or a specific person (or group) available to give guidance to self-archive in the OAIRs was found to have a statistical significance difference at a 5% level of significance ($p \leq 0.05$). The implication was that technical support was needed for effective self-archiving among faculty members. For instance, effective self-archiving may only be guaranteed in the presence of an ICT technician or library technician or specific person.

On the other hand, qualitative findings indicated the importance of technical support to enable self-archiving of scholarly publications in OAIRs. One key informant explained:

"Generally, most of the faculty members self-archive their scholarly publications in OAIRs, because there are librarians around to provide technical supports."

Influence of peers, supervisors and colleagues on self-archiving of scholarly publications in OAIRs. Table 6 presents the influence of peers, supervisors and colleagues on self-archiving of scholarly publications in OAIRs. Results shows that faculty members are influenced by supervisors to self-archive (30.8%). They also influenced by colleague (22.3%), peers (22%), the work place (18.2%), and university (17.1%) to self-archive.

"Colleague encourage me to self-archive" was found to have a statistically significant difference at a 5% level of significance ($p \leq 0.05$). The implication was that there was need to encourage colleagues who self-archive their scholarly publications in OAIRs to encourage other faculty members who are not self-archiving. For instance, effective self-archiving may only be guaranteed by encouragement from colleagues.

Supporting services needed by faculty members to self-archive in the university's OAIRs. Table 7 presents the ICT Infrastructure needed to self-archive scholarly publications in OAIRs. Results show that 28.4% of the faculty members self-archive their scholarly publications in OAIRs because of the availability of the Internet speed, reliable electricity (27.1%), have enough time (27.1%), availability of enough computer (21.9%), the availability of user friendly

Table 5. Technical support needed for self-archiving scholarly publications in OAIRs ($n = 135$).

Statement	Yes	No	p-Value
Technical skills and knowledge make self-archiving of scholarly publications in OAIRs easy	63 (21.6%)	72 (24.7%)	0.102
Guidelines are available to support self-archiving of scholarly publication in OAIRs	77 (26.4%)	58 (19.8%)	0.08
Availability of technical personnel – ICT technician or library technician or specific person (or group) is available to give guidance to self-archive in the OAIRs	72 (24.7%)	63 (21.6%)	0.011
Procedure to self-archive is easy to follow	65 (22.3%)	70 (23.9%)	0.396
Librarians are available to give me guidance to self-archived in the OAIRs	85 (29.1%)	50 (17.1%)	0.014

Source: Field Data (2020).

Table 6. Influence of peers, supervisors and colleagues on self-archiving of scholarly publications in OAIRs ($n = 135$).

Statement	Yes	No	p-Value
My colleagues encourage me to self-archive	65 (22.3%)	70 (24%)	0.014
My university wants me to self-archive	50 (17.1%)	85 (29.2%)	0.233
My work place wants me to self-archive	53 (18.2%)	82 (28.1%)	0.677
My peers encourage me to self-archive	64 (22%)	71 (24.3%)	0.401
My supervisors want me to self-archive	90 (30.8%)	45 (15.4%)	0.135

Source: Field Data (2020).

software (21.6%) and skills of using ICT tools enable self-archiving scholarly publications in OAIRs (20.5%).

“The skills of using ICT tools” and “the availability of the user-friendly software” was found to have no statistically significant difference at a 5% level of significance ($p \geq 0.05$). The implication was that ICT infrastructure were needed for effective self-archiving among faculty members. For instance, effective self-archiving may only be guaranteed in the presence of technical skills, adequate internet and reliable electricity.

On the other hand, qualitative findings indicated the importance of having Internet to enable self-archiving of scholarly publications in OAIRs. One key informant explained:

Generally, most of faculty members self-archived their scholarly publications in OAIRs, because the availability of Internet encourages self-archiving scholarly publications in the OAIRs.

Influence of gender, age, level of education, and work experience on self-archiving. Table 8 presents the influence of gender, age, level of education, and work experience on self-archiving. The results show that 52.3% of male faculty members self-archive more of their scholarly publications in OAIRs than female faculty members. Faculty members (45.5%) with ages between 36 and 45 self-archive more of their scholarly publications in OAIRs. The faculty members with Master’s Degree (40.0%) self-archive more of their scholarly publications in OAIRs, and faculty members (50.7%) with more than 11–15 years of working experience self-archive more.

The results indicate that gender, age, level of education, and working experience were found to have statistical significance differences at a 5% level of significance (p -values ≤ 0.05). The implication was that the female faculty members, older faculty members, those with low level of education and those with more working experience would need more motivation, assistance and support to self-archiving their scholarly publications in OAIRs.

On the other hand, qualitative findings indicated the influence of moderators in self-archiving of scholarly publications in OAIRs. One key informant explained:

“Generally, most of faculty members who self-archived their scholarly publications in OAIRs are those who are coming from university.”

The implementation of OAIRs policies on self-archiving of scholarly publications in OAIRs

Table 9 presents the implementation of OAIR policies on self-archiving of scholarly publications in OAIRs. Results show that faculty members self-archived their scholarly publications in OAIRs because OAIR policies mandate them to self-archive their scholarly publications in OAIRs (30.8%), the universities forcing them to self-archive (22.3%), policy procedures enable self-archiving of scholarly publications in the OAIRs (22%), availability of copyright issues encourage self-archiving of scholarly publications in the OAIRs (18.2%) and availability of OAIR policies encourage self-archiving of scholarly publications in the OAIRs (17.1%).

Table 7. ICT Infrastructure needed to support self-archiving of scholarly publications in OAIRs (n = 135).

Statement	Adequate	Neutral	In adequate	p-Value
Enough time to self-archive scholarly publications in OAIRs	79 (27.1%)	34 (11.6%)	22 (7.5%)	0.000
Reliable electricity	79 (27.1%)	40 (13.7%)	16 (5.5%)	0.000
Availability of enough computers	64 (21.9%)	49 (16.8%)	21 (7.2%)	0.009
User friendly software available makes the process of self-archiving scholarly publications in the OAIRs easy	63 (21.6%)	52 (17.8%)	20 (6.8%)	0.114
Availability of Internet speed enable self-archiving of scholarly publications in the OAIRs	83 (28.4%)	39 (13.5%)	13 (4.5%)	0.000
The skills of using ICT tools enables self-archiving of scholarly publications in OAIRs	60 (20.5%)	52 (17.8%)	23 (7.9%)	0.114

Source: Field Data (2020).

The university forcing them to self-archive in the OAIRs was found to have a statistically significant difference at a 5% level of significance ($p \leq 0.05$). The implication was that the OAIRs policy was very important for effective self-archiving among faculty members. For instance, the presence of an OAIR mandate policies may guarantee effective self-archiving among faculty members.

On the other hand, qualitative findings indicated the reasons why self-archiving scholarly publications in OAIRs was done. One key informant explained:

"Generally, most of faculty members self-archived their scholarly publications in OAIRs, because of the OAIRs mandate policy."

Challenges that influence self-archiving of scholarly publications in OAIRs

Table 10 presents challenges that influence self-archiving of scholarly publications in OAIRs. Results show that challenges that influence self-archiving of scholarly publications in OAIRs among faculty members were low level of awareness and inadequate advocacy for a self-archiving (30.8%), lack of personal benefit such as rewards and promotions (22.3%), fear of the issues concerning plagiarism (22%), lack of enough facilities like ICT and internet connectivity (18.2%) and lack of time and effort required for them to self-archive (17.1%).

Lack of personal benefit such as rewards and promotions were found to have a statistically significant difference at a 5% level of significance ($p \leq 0.05$).

The implication was that there was a need to remove challenges that influence self-archiving of scholarly publications in OAIRs. For instance, effective self-archiving may only be guaranteed in the presence of an ICT technician or library technician or a specific person.

On the other hand, the qualitative findings provided justification for the challenges that influence to self-archiving scholarly publications in OAIRs. One key informant explained:

"Faculty members are not self-archiving their scholarly publications in OAIRs because they are influenced by fear of the issues concerning plagiarism, copyright, time and effort required of them to self-archive."

Discussion

The study investigated how self-archiving of scholarly publications in Open Access Institutional Repositories (OAIRs) could be strengthened for improved access to local contents in Tanzania. The study population was faculty members from four selected public universities in Tanzania. Based on the age, gender, academic level, and work experience was clear that respondents were highly educated experienced and expected to had several publications to self-archive in the university OAIRs. The study also found out that few faculty members were self-archiving their publications in OAIRs. The study also found out that gender, age, level of education and working experience had a positive influence on self-archiving of scholarly publications in OAIRs. This was because male, young, and faculty members with more working experience and a high level of education were more eager to try new technologies than the rest. This was similar to the study done by Welch et al. (2020), who found that more working experience and a high level of education had a positive influence on the use of technology. The implication was that there was need to create more awareness for those who were not self-archiving and provide knowledge and skills to faculty members on how to self-archive their scholarly publications in OAIRs. This could be done through conducting seminars, trainings, workshops, and during orientations.

The study also found factors that influence self-archiving of scholarly publications in OAIRs including: motivating factors such as wanting to share their scholarly publications with other faculty members, wanting to increase the visibility of their work and wanting to preserve their scholarly publications for future use. The implied that motivating factors were very important to faculty members to self-archiving their scholarly publications in OAIRs. Without motivating factors, faculty members

Table 8. Characteristics of respondents and their influence on self-archiving scholarly publications in OAIRs ($n=292$).

Influence on self-archiving scholarly publications in OAIRs		
Variable	Frequency (%)	p-Value
Gender		
Male	92 (52.3)	0.011
Female	43 (37.1)	
Age		
20–35	30 (36.6)	0.005
36–45	50 (45.5)	
46–50	24 (45.3)	
51–60	18 (54.5)	
61 and above	13 (92.9)	
Level of education		
PhD	53 (54.1)	0.011
Masters	54 (40.0)	
Bachelor	27 (47.4)	
Post Graduate Diploma	1 (25.0)	
Working experience		
1–5	2 (32.1)	0.002
6–10	27 (39.7)	
11–15	38 (50.7)	
16–20	20 (55.6)	
21–25	11 (64.7)	
26 and above	14 (77.8)	

Source: Field Data (2020).

would never self-archive in OAIRs. This reason was discouraging because self-archiving scholarly publications in OAIRs was supposed to be part and parcel of the academic activities of the faculty members. Faculty members should be encouraged to self-archive not only for their benefit but for the benefit of the institution as well. These results were different from the results found by Lee et al. (2019) who found out that the and the belief that deposited works in IR may not be able to publish elsewhere later, time and efforts motivation factors for self-archiving were accessibility, altruism, reciprocity, trust, self-efficacy, reputation, and publicity.

Similarly, this study found supporting services that enabled faculty members to self-archive their scholarly publications in OAIRs. These supporting services included ICT infrastructures such as the availability of the Internet, computer, and User-friendly software. This finding was similar to the study done by Abbad (2021) who found out facilitating conditions such as ICT infrastructures had direct impact on behavior intention to adopt or use technology. Therefore, the university and the library management should make sure that there are enough ICT infrastructures like computers and enough Internet to facilitate the process of self-archiving scholarly publications in OAIRs.

This study found the following technical support services to be essential for the effective self-archiving of scholarly publication in OAIRs; the availability of

librarians to provide self-archiving guidance, availability of guidelines to support the self-archiving process, the availability of technical personnel such as ICT technician or library technician or specific person (or group) to provide self-archiving guidance. This finding was similar to the study done by Mwalubanda (2021) who emphasized that technical support was very important in the development of IRs in East Africa. Idiegbeyan-ose et al. (2020) also found out that it is very important to have technical support, especially the ICT personnel or unit technical support while self-archiving was done. González-Pérez et al. (2021) study also showed motivating an academic community to use an institutional repository required technological functions, user guidelines that identified what could or could not be published in open access, and training programs for open access publication practices and institutional repository use. Therefore, the university and the library management should make sure that there is personnel support such as ICT technicians or library technicians, guidance form library staff, and guideline or manual to help when self-archiving scholarly publications in OAIRs.

The study also found how OAIRs policies could be implemented to enhance self-archiving of scholarly publications. Availability of OAIRs policies were found the important strategy that encouraged faculty members to self-archive their scholarly publications in the university's OAIRs. This implied that the availability of OAIR policies such as mandates to self-archive and policy procedures encouraged faculty members to self-archive their scholarly publications in the university OAIRs. This finding was similar to the study done by Mwalubanda (2021) who emphasized that mandate policies should be formulated to provide a guideline on how scholarly information would be deposited and presented in OAIRs. However, Baro et al. (2018) found out that mandates by institutions or funding bodies were not a very important factor that motivated faculty members to contribute their papers to self-archiving platforms. Although Baro et al. (2018) study did not support having institutional or funding mandates, it is essential for the university and the library management should make sure that the OAIR policies on self-archiving should be implemented to support the self-archiving of scholarly publications in OAIRs.

The study also found challenges that influence self-archiving of scholarly publications in OAIRs: low level of awareness, inadequate advocacy, and fear of plagiarism, time and effort and lack of personal rewards. The implication was that challenges that influence self-archiving of scholarly publications in OAIRs were causing low attitude of self-archiving among faculty members in Tanzania universities. The results were similar to Chilimo (2016) and Dutta and Paul (2014) who argued that lack of awareness, inadequate advocacy, and fear of plagiarism were known demotivating in faculty participations in self-archiving.

Table 9. OAIRs policy implementation in supporting self-archiving of scholarly publications in OAIRs ($n = 135$).

Statement	Yes	No	p-Value
The university forces to self-archive	65 (22.3%)	70 (24%)	0.014
Availability of OAIR policies encourage self-archiving of scholarly publications in the OAIRs	50 (17.1%)	85 (29.2%)	0.233
Availability of copy-right issues encourage self-archiving of scholarly publications in the OAIRs	53 (18.2%)	82 (28.1%)	0.677
Policy procedures enable self-archiving of scholarly publications in the OAIRs	64 (22%)	71 (24.3%)	0.401
OAIRs policy mandate to self-archive scholarly publications in OAIRs	90 (30.8%)	45 (15.4%)	0.135

Source: Field Data (2020).

Table 10. Challenges that influence self-archiving of scholarly publications in OAIRs ($n = 135$).

Barriers	Yes	No	p-Value
Lack of personal benefit such as rewards and promotions	65 (22.3%)	70 (24%)	0.014
Lack of time and effort required of them to self-archive	50 (17.1%)	85 (29.2%)	0.233
Lack of enough facilities like ICT and internet connectivity	53 (18.2%)	82 (28.1%)	0.677
Fear of the issues concerning plagiarism	64 (22%)	71 (24.3%)	0.401
Low level of awareness and Inadequate advocacy for a self-archiving	90 (30.8%)	45 (15.4%)	0.135

Source: Field Data (2020).

Therefore, factors which motivate and challenge faculty members should be increased and improved respectively in order to enhance self-archiving of scholarly publications in OAIRs among faculty members.

The study adopted the UTAUT model theoretical model and found it to be suitable in predicting the factors that influence self-archiving of scholarly publications in OAIRs among faculty members of the selected universities in Tanzania. The study modifies some of the variables to suit the universities settings. For example, voluntariness was replaced with the level of education because the study aimed establishing whether the level of education was influencing self-archiving among faculty members. This study was not similar to the study done by Singeh et al. (2013), who argued that the UTAUT model was used to assess self-archiving practices in Malaysia but the model did not did not suit the study.

Conclusions and future work

This study investigated how self-archiving of scholarly publications in Open Access Institutional Repositories (OAIRs) could be strengthened for improved access to local content in Tanzania. The key findings indicated that there were motivating factors that influenced self-archiving of scholarly publications in OAIRs among faculty members such as; wanting to share their scholarly publications with other faculty members, wanting to increase the visibility of their work and wanting to preserve their scholarly publications for future use. The other factors that influenced the self-archiving process by faculty members were; technical support, influence of supervisors/peers/colleagues, supporting services needed, influence by

gender, age, education level and working experience, and OAIRs policy implementation. The study also found demotivating factors: low level of awareness and inadequate advocacy for self-archiving, lack of personal benefit such as rewards and promotions, fear of the issues concerning plagiarism, lack of enough facilities like ICT and internet connectivity and lack of time and effort required for faculty members to self-archive. In order to strengthen self-archiving of scholarly publications for improved access to local contents in Tanzania the study recommended providing supporting services such as ICT infrastructure, technical support such as ICT technicians, encourage supervisors/peers/colleague or the university, improve de-motive creation of awareness, provide personal benefit such as rewards and promotions, educating faculty members on issues concerning plagiarism and giving them more time and effort to self-archive and implement OAIR policies in order to enhance the process of self-archiving scholarly publications in OAIRs among faculty members of selected universities in Tanzania.

Future work

The study suggests that future research should investigate more on other models and find out if there are other variables that help in predicting factors that influence self-archiving of scholarly publications in OAIRs in developing countries other than those found in this study.

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4.0 CHAPTER FOUR

The Influence of Open Access Institutional Repository Submission Policy in the collection of OAIR contents

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Abstract

The study investigated how OAIR submission policy can be used to improve OAIR contents. Specifically, the study assessed the presence of the OAIR submission policy in the selected universities, examined the use of OAIR submission policy in the collection of OAIR contents, and determined how the OAIR submission policy can be used to improve the collection of OAIR content. Systematic random and purposive sampling procedures were used to select the study sample, which comprised 413 academic staff and 8 key informants. The study collected both qualitative and quantitative data and primary and secondary data. Interviews and structured questionnaires were used to collect primary data while literature on OAIRs, OAIR policy documents, and statistics from ROAR and Open DOAR were used to collect secondary. Data were analysed by using SPSS version 22 and content analysis. Key findings revealed that the OAIR submission policy is available in their universities, as reported by 46.2 per cent of the respondents. The findings also revealed that OAIR submission policy has been used to direct academic staff to submit their scholarly publications in OAIRs (45.5%). Furthermore, to improve the collection of OAIR contents, regular awareness creation of the rules and regulations on how to submit in OAIRs was cited 24.5 per cent of the respondents as important strategy of increasing the use of OAIRs cited. About 18.5 per cent of the respondents suggested effective implementation of OAIR submission policy for academic staff members to submit in the university OAIRs as another strategy. About 16.3 per cent suggested for an increase visibility and accessibility of OAIR policy through the university website; and about 14 per cent suggested that OAIRs submission policy be made clear to authors and the institutions operating the OAIRs. Accordingly, the study concludes that OAIR submission policy has a positive influence on the use of OAIRs among members of academic staff; without a policy, OAIRs may remain virtually empty.

Keywords: Open Access Institutional Repository (OAIRs), OAIR submission policy, mandate policy, scholarly publications, universities, Tanzania.

1.0 Introduction

The emerging of information communication technology (ICT) has enabled libraries to develop Open Access Institutional Repositories (OAIRs). Kumah and Filson (2022) define OAIRs as a digital archive that preserves scholarly publications of an institution. Scholarly publications that can be archived include theses, dissertations, book chapters, conference proceedings, journal articles, book chapters, manuals, and course syllabi (Ibinaiyi *et al.*, 2015). Scholarly publications are collected, preserved, and disseminated to institution community worldwide freely and without any barriers (Abrizah *et al.*, 2017).

In the 2000s, there was a substantive growth of OAIRs in different institutions in the world. However, these OAIRs face myriad challenges including low submission of research outputs, lack of content and lack of OAIR policies including submission policy (Kari and Orji, 2022; Baro *et al.*, 2022). Moreover, lack of an OAIR submission policy is a major challenge reported to have been slowing down the speed of collecting OAIR contents (Ukwoma and Ngulube, 2019). Low submission and dearth of contents have compelled various institutions in the USA to initiate and formulate OAIR policy in 2008 to address these challenges faced by OAIRs. OAIR policy was used as a road map to direct operations for the sustainability of OAIRs. Some of the provisions included in the policy include who can use the services provided by OAIR, the type of content to be held, the terms and conditions of preservation, access, and withdrawal (Koulouris *et al.*, 2013; Mwalubanda 2021; Ukwoma and Ngulube 2019; Nunda and Elia, 2019; Chilimo, 2015).

Recently, different, institutions, funding agencies and academic programmes around the world have formulated the OAIR policies such as submission policy, preservation policy, metadata policy, full-text data policy, and content policy, which are used to direct, and fast-track the submission of content in the OAIRs (Njagi and Namande, 2018; Roy *et al.*, 2018).

To enable the collection of OAIRs contents in the OAIRs, the submission and metadata policies were adopted and used by various institutional libraries to direct intellectuals to submit their scholarly publications in OAIRs. For example, in Kenya the submission policy was used to mandate members of academic staff to submit or self-archive their scholarly publications in the university OAIR. A similar observation is made by Chilimo (2015) that the submission policy necessitates the collection of OAIRs content because this policy directs academic staff members to submit or self-archive their scholarly publications in the university OAIRs. Therefore, OAIRs submission policy helps different OAIRs to accumulate contents to meet information needs of their institution communities (Njagi and Namande, 2018). To improve the collection of contents in OAIRs, custodians of the OAIRs should first raise awareness on the rules and regulations concerning how members of the academic staff can submit the publications in the OAIRs. OAIR submission policy should be effectively implemented, and academic staff members need to be encouraged to submit their scholarly publication in OAIRs. OAIRs should be made visible and accessible through the university platforms and the relationship between the author and the institutional that operating the OAIRs should be clearly stated.

Public universities in Tanzania such as Muhimbili University of Health and Allied science (MUHAS), Mzumbe University (MU), Sokoine University of Agriculture (SUA), and University of Dar Es Salaam (UDSM) initiated OAIRs submission policy since 2012 which aimed at enabling submission, accessibility, and dissemination of research outputs generated by staff, students and other researchers (SUAIR Policy, 2014). The submission policy in these universities directs academic staff members, students and other researchers to contribute their scholarly publications to OAIRs by submitting or self-archiving their research outputs into the repository at the earliest possible time (MUHAS OAIRs policy, 2012; SUAIR Policy, 2014 and UDSM OAIRs policy, 2015).

Despite the availability of OAIRs submission policy in different libraries in the world, OAIRs in Tanzanian libraries still face low submission and low number of contents contributed in their OAIRs. This is in contrast to submission rate of scholarly publications produced by faculty members in universities in other countries (Mbughuni *et al.*, 2022; Mwalubanda, 2021 Gul, Bashir and Ganaie, 2019 and Sahu and Parabhoi, 2019). According to Xia *et al* (2012) and Lynch (2003), most institutions have OAIRs submission policies, which are undefined and lack OAIR policy guidelines.

1.2 Statement of the Problem

OAIRs archive scholarly publications produced by academic staff members in the academic institution. However, many scholarly publications are not preserved in OAIRs and therefore cannot be visible. OAIRs are established to make these publications available and accessed online. To enrich the collection of OAIR contents and to make them more visible to the institution community, there is a

need of formulating OAIR submission policy that will enhance the depositing and accumulation of contents in OAIRs. Despite the formulation of OAIRs submission policy, OAIRs in Tanzania still experience low submission and low number of contents. This is in contrast to submission rate and scholarly contents available in OARIS of universities in other countries (Mbughuni *et al.*, 2022; Mwalubanda, 2021; Kayungi *et al.*, 2021; Elia and Nunda, 2019; Malekani and Kavishe, 2018; Chirwa and Mnzava, 2017; Muneja and Sichalwe, 2016). Therefore, this study was set to investigate how OAIR submission policy can be used to improve the collection of content in OAIRs.

1.3 Objective of the study and research questions

The study investigated how OAIR submission policy can be used to improve OAIR contents. Specifically, the study assessed the presence of the OAIR submission policy in the selected universities, examined the use of OAIR submission policy in the collection of content in OAIRs in the selected universities, and determined how the OAIR submission policy can be used to improve the collection of OAIR content. In meeting these objectives, the study responded to these research questions: Does the OAIR submission policy exist in the selected universities? How does the use of OAIR submission policy enhance the collection of content in OAIRs in the selected universities? How can OAIR submission policy be used to improve the collection of OAIR content?

The current study is envisaged to create awareness of OAIR submission policy especially on rules and regulation among

academic staff members on their obligations regarding the submission of local content. Furthermore, the findings will enable faculty members to know how OAIR policy is used, what motivates staff to submit their academic publications to the OAIRs. The study will also provide insights to the Library Management into how the usage of the OAIR submission policy can be improved to enhance the growth of OAIR contents.

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2.0 Literature Review

The study reviewed different literature including the existence of the OAIR submission policy and the usage of OAIR submission policy in the collection of OAIR contents and how the OAIR submission policy can be used to improve the growth of OAIR contents.

2.1 OAIR policy

OAIR policy plays a vital role to direct on issues concerning collection, management, preservation, and accessibility of OAIR contents (Nneji, 2018). OAIR policy focuses on three aspects, which are content, access, and preservation (Riddle, 2015). Content policy provides guidance on the material that are eligible to include in OAIRs and who is supposed to submit material. Access policy identifies the kinds of users who are eligible to access the content and preserve it. OAIR policy assures that the material in the OAIRs is well protected against copyright issues and unauthorized access, and the fate of the material once the OAIRs are terminated.

OAIR submission policy is instructive in the submission of content in OAIRs; as a result, OAIR was adopted and formulated by different institutions. European countries such as Austria, Germany, Switzerland, and some Asian countries were reported as the first to adopt and use the OAIR policy. OAIR policy used included metadata, data, content, and submission and preservation policy. However, 40.89 per cent of OAIRs were

identified as not having defined or framed their OAIR policy for their OAIRs (Sahu and Parabhoi, 2019).

In Africa, the use of OAIR policy lags behind then use of OAIR policy in European countries, however, recent trends indicate that an increase in OAIRs use in African countries will be catalysed by the formulation of OAIR policies (Ogunbeni, 2019). Despite the promising trend in the development of OAIRs in Africa, most OAIRs lack OAIR policies (Mwalubanda, 2021; Gul, 2020; Sahu and Parabhoi 2019). The lack of OAIR policies led to challenges in various OAIRs especially in the growth and submission of OAIR content. According to Mwalubanda (2021), OAIR policy is essential in the growth of OAIRs; thus, its formulation should consider different stakeholders.

2.1.1 Presence of the OAIR submission policy in institutions

The availability of OAIR submission policies in institutions has been recognized as a significant element in the growth of OAIR contents. The presence of OAIR submission policies in institutions direct who submit the material, who accesses the content, what are the copyright assurance issues and what guarantee future access, and what will happen if the OAIRs are terminated. Despite this, most universities lack OAIR submission policies (Abrizah *et al.*, 2017; Dutta and Dibyendu, 2014). Lack of OAIR submission policy contributes to low submission of scholarly publications in OAIRs. Chilimo (2016) revealed that out of 317 academic universities in Kenya, three adopted mandatory open-access policies. However, the availability of OA policy was low, and as a result, self-archiving was not widely practiced. In determining the presence of OAIR submission policy in universities, Okoroma (2018) revealed that universities lack publishers' policies. Accordingly, OA policy is the major challenge facing the usage of OAIRs in African academic institutions.

Moreover, Wesolek (2015) revealed that OAIR submission policy formulated in different institutions are not known and suggested that libraries should create awareness on OAIR submission policies and procedures, especially involve users' rights. Despite the formulation of OAIR submission policy in universities, the

submission of scholarly publication by faculty members is very important. The presence of OAIR submission policy is supposed to lead to content submission and self-archiving in OAIRs.

2.2.3 The use of OAIR submission policy in the collection of OAIRs contents

The essence of formulating submission policy is to make clear how contents in OAIRs can be submitted or collected from the university communities. Institutions can only attain submission goals by setting clear OAIRs policies that will act as a reference point and facilitate the gathering of OAIRs contents (Eromosele, 2022; Nneji, 2018). As clarified by Riddle (2015), the submission policy is used to guide the eligible material to be included in the OAIRs and the person to submit them.

Koulouris (2013) emphasized that, for the proper collection of contents, the submission policy should mandate academics to contribute to academic publications in the OAIRs. This will lead in an increased number of OAIR contents in university repositories. As Saini (2018) observes, the absence of a well-defined submission policy for OAIRs discourages academic staff members from depositing their research output in the OAIRs.

According to Saini (2018), OAIR submission policy is used to define the intellectual property rights, copyright and legal concerns of the author. This policy would inspire academic members to submit their scholarly publications in OAIRs. Despite the usage of the OAIR submission policy, different institutions failed to implement OAIRs policy regarding the collection of OAIRs contents (Mwalubanda, 2021; Gul, 2020; Sahu and Parabhoi 2019). In view of the previous observations, it is evident that the use of OAIR policy can potentially lead to increased local contents deposited in OAIRs.

2.2.4 How can the OAIR submission policy be used to improve the collection of OAIR content?

OAIR submission policy is very significant in institutions because it contains objectives of the institution's OAIRs, which are crucial in improving the growth of contents (Kari and Orji, 2022). OAIR

submission policy also enables the owner of the OAIRs to monitor the process and ensure that the contents in OAIRs are submitted as directed by the policy; the policy also specifies the type of contents to be uploaded in OAIRs and ensures that the contents meet the information needs of the academic staff.

According to Makori *et al.* (2015), the usage of OAIR submission policy can be improved and used in day-to-day operations. It is believed that most of the OAIR adopted policies remain in paperwork and are not implemented as intended (Adeyemi *et al.*, 2017). Moreover, the adopted OAIRs policies are, largely, undefined and under-analysed. Thus, having clear strategies on how to use the OAIR submission policy can improve the growth of OAIR content. However, the implementation of the OAIR policy is below the targeted expectations in different continents, especially in Africa.

For OAIR submission policy to be well implemented and used, institutions and Library Management should be given the opportunity to formulate OAIR submission policy because they are the ones dealing with OAIRs. This will enable them make follow-ups and use the rules and regulations stated in the OAIR submission policy. A similar observation is made by Dong and Besiki (2017) who revealed that Library Management should be permitted to cascade information on the OAIR submission policy and draw up implementation guidelines to inform all stakeholders. In addition, Kakai (2018) suggests that for OAIRs to function well, the top-down development of OA submission policy should begin with government and funding agencies to allow the institutions to develop OAIR submission policy as stakeholders. This will provide prior knowledge of OA submission policy and easily implement OAIR submission policy. In this respect, as stated by Samzugui (2017), the formulation and use of OAIR submission policy will lead to the 'best practices' which would enhance the effective and widespread use of OAIRs in the area of collection. If policies such as submission are implemented, scholarly materials would be submitted and self-archived and hence increasing the number of contents leading to the growth of OAIRs. As confirmed by

Mwalubanda (2021), formulating, and implementing a good OAIR submission policy can have a positive impact on the usage of OAIRs, especially on content submission. Without the implementation of the OAIR submission policy, the university OAIRs will not operate successfully. Therefore, the implementation of the OAIR submission policy will help in the sustainability of OAIRs.

2.3 Theoretical framework

Theories that explain users' intentions for the adoption of technology have been adopted in various studies (i.e., Dulle and Majanja, 2010, Henok and Yule, 2019; Onaolapo and Oyewole, 2018; Venkatesh *et al.*, 2003). These theories included The Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB), the Theory of Diffusion of Innovation (DIT), the Technology Acceptance Model (TAM), the Technology Acceptance Model 2 (TAM2), the Unified Theory of Acceptance, the Use of Technology (UTAUT) Model, and the Technology Acceptance Model 3 (TAM3).

This study used the Unified Theory of Acceptance and the Use of Technology (UTAUT) because these theories are used to explain individual behaviours on the use of information system, which in the case of this study is OAIRs.

2.3.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is a technology acceptance model developed by Venkatesh *et al.* in 2003. The model explains user behavioural intentions of using information technology. According to Venkatesh *et al.*, (2003), the UTAUT model has four independent variables namely, Performance Expectancy: The individuals' trust that the use of the technologies will result in performance gains; and the Effort Expectancy: The comfort of use of the technologies. Others include Social Factors: colleagues, peers, and supervisors trust that one should use the technologies; and Facilitating Conditions: organizational and technical infrastructure, which are necessary for the support of the technologies do exist. The model also has four

moderating variables that is, education age, gender, and voluntariness of use.

2.3.2 Conceptual framework

According to the nature of the study, the UTAUT model was adopted to replace some of the variables in formulating the conceptual framework of the study. Therefore, the independent variables include the motivating factors, technical factors, supervisors, colleagues and OAIRs submission policy; and the dependent variable was the use of OAIRs for submission or self-archiving of scholarly publications. The moderators were age, sex, academic qualifications, awareness, and working experience. The study replaced voluntariness with awareness because awareness is important in the usage of OAIRs.

In the background of this study, motivational factors were said to mean the degree to which academic staff members are motivated by the OAIRs submission policy into using OAIRs to submit their research outputs in OAIRs. Technical factors mean how it is made easy to academic staff members to use OAIRs submission policy to submit their research outputs in OAIRs and improve OAIR content. Supervisors and colleagues refer to how institutions use OAIRs submission policy to encourage academic staff members to use OAIRs to submit their research outputs in OAIRs to improve OAIR content. OAIR submission policy refers to the way the policy directs academic staff members to use OAIRs to submit their research outputs in OAIRs.

Therefore, based on the research conceptual frame, motivational and technical factors, supervisors, colleagues, and OAIR submission policy have a significant relationship to the use of

OAIRs by staff to submit/self-archive scholarly publications. In addition, gender, age, awareness, and working experience are believed to have a significant relationship to the use of OAIRs by staff to submit and or self-archive their contents in the OAIRs (Figure 5.1).

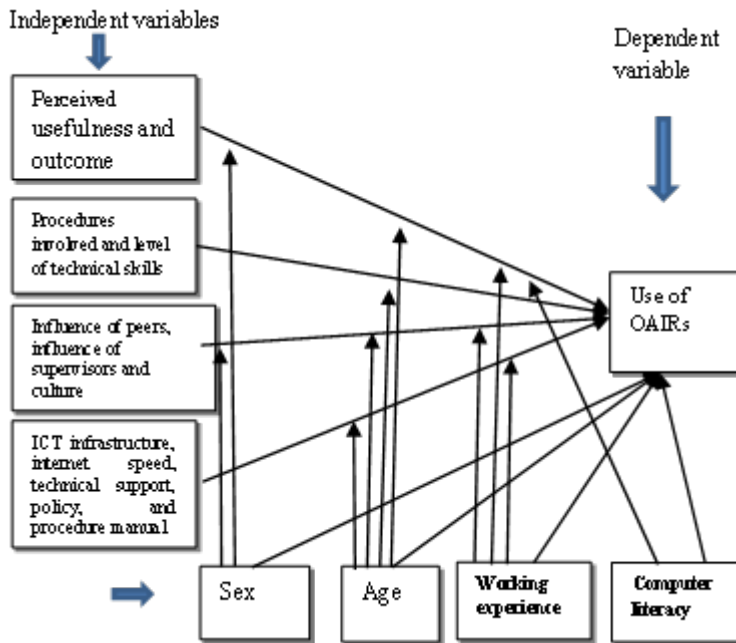


Figure 5.1: Modified Conceptual Framework for the study

3.0 Methodology

The study selected four public universities in Tanzania: Mzumbe University (MU), Muhimbili University of Health and Allied Sciences (MUHAS), Sokoine University of Agriculture (SUA), and the University of Dar es Salaam (UDSM). The selected universities have OAIR submission policies, which are operative.

A cross-sectional research design was used in this study as it allows collecting both qualitative and quantitative data and collecting data from a population at a specific point in time. About 2894 academic staff members were selected from four selected public universities. About 413 academic staff members were obtained by using the formula known as Slovin's ($n=N/(1+Ne^2)$).

The study used systematic random where every 6th academic staff member was picked from the list of academic staff members in the selected universities. Purposive sampling techniques were used to acquire eight key informants (Heads of Department, ICT, and Library Technicians) from the four universities to provide information concerning OAIR policy because they are the ones who are knowledgeable and formulated OAIR policy.

A structured questionnaire was used to gather quantitative primary data, which were distributed to 413 academic members of staff, that is MUHAS (77), MU (47), SUA (43), and UDSM (125). About 292 questionnaires were filled and returned making a return rate of 70.7 per cent. Interviews with key informants (four Heads of Department, two ICT technicians, and two Library Technicians) were used to gather qualitative primary data.

Secondary data were composed from documentary sources including, Universities' OAIRs policy documents to understand the concept of the study and the existing literature on OAIRs policy to get an overview of different OAIR policies.

Quantitative data were analysed by using SPSS software Version 22. The specific objective of the study guided the data analysis process. As for objectives numbers one to three, inferential

statistics were calculated by cross-tabulating variables to obtain p-values to determine the relationships and determine the existence or absence of any statistically significant difference among the variables. To obtain frequencies and percentages of different data, descriptive statistical analysis was used.

Quantitative data were analysed by using SPSS software Version 22. Data were analysed according to the specific objective of the study whereby objectives numbers one to three, inferential statistics were calculated by cross-tabulating data variables to generate p-values that were used to determine the relationships among variables and determine the presence or absence of any statistically significant difference among the variables. To obtain frequencies and percentages of different data, descriptive statistical analysis was used.

The content analysis technique was used to analyse qualitative data. The data acquired were organized according to the specific objectives and research questions. In addition, the verbatim quotations were recorded and placed under specific objectives. The results were presented with explanations.

4.0 Results and discussions

4.1 Demographic characteristics

4.1.1 Number of respondents in each university

Findings in Figure 5.2 indicate that 42.85 per cent of the respondents were from UDSM, 26.4 per cent were from MUHAS, 16.1 per cent were from MU, and 14.7 per cent were from SUA.

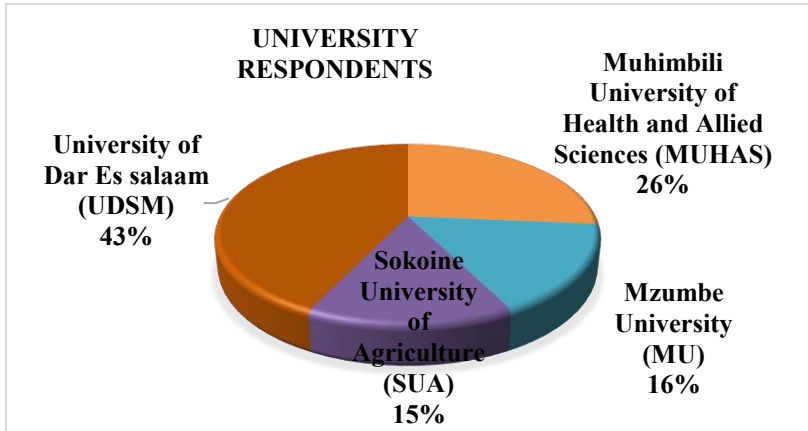


Figure 5.2: University of the respondents (n=292)

Source: Field Data (2020)

4.1.2 Sex of the respondents

Findings in Figure 5.3 indicate that 60.3 per cent were males and 39.7 per cent were females. This implies that more male than female faculty members participated in this study.

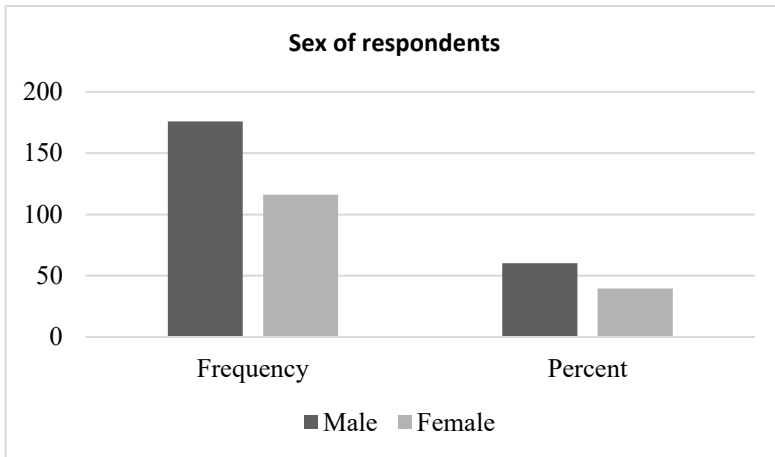


Figure 5.3: Sex of respondents (n=292)

Source: Field Data (2020)

4.1.3 Age of respondents in years

Findings in Figure 5.4 indicate that 37.7 per cent of the respondents were between 36 to 45 years, 28.1 per cent were between 20 to 35 years, and 18.2 per cent were between 46 to 50 years of age. This implies that the respondents were mature enough to be aware of the rules and regulations directed by the OAIR policy especially in the submission of scholarly publication in the university OAIRs. This enables them to submit immediately their research outputs to university OAIRs. Therefore, the university and the Library Management should continue to create more awareness and encourage academic staff to submit their scholarly publications in OAIRs by adhering with the OAIR submission policy to understand their rights, especially on the submission and preservation of their scholarly publications. Awareness can be raised through training, workshops, seminars, and orientation. Creating awareness on the

issue pertaining to submission will improve the self-archiving of scholarly publications and thereby improve the number of OAIR content.

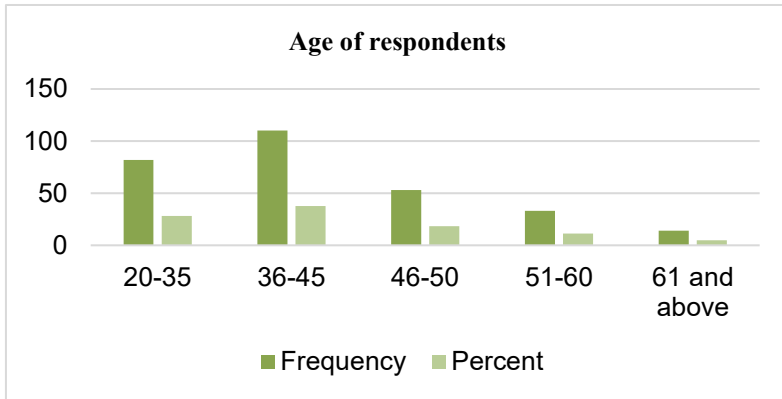


Figure 5.4: Age of respondents (yrs.) (n=292)

Source: Field Data (2020)

4.1.4 Academic Qualifications of the respondents

Findings in Figure 5.5 indicate that 45.5 per cent of the respondents had a master's degree, 33.6 per cent had a PhD, 19.5 Bachelor, and 1.45 per cent had a Postgraduate diploma. This implies that the respondents were well educated. This reality gives them the leverage of producing several articles to submit or self-archive in the OAIRs. Thus, the university management and the library should implement OAIR submission policy to inspire academic staff members to contribute their research outputs in OAIRs.

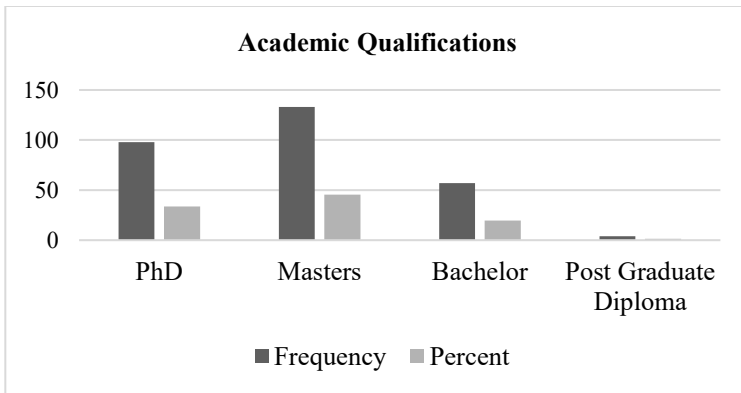


Figure 5.5: Academic Qualifications (n=292)

Source: Field Data (2020)

4.1.5 Working experience of the respondents

Findings in Table 5.2 indicate that 26.6 per cent of the respondents had working experience of 1-5 years, 25.7% (11-15 years), 23.3 per cent (6-10 years), 12.3 per cent (16-20 years), 6.2 per cent (26 and above years) and 5.8 (21-25 years). This implies that the respondents had enough years of experience. This reality gives them a chance of having several articles and knowledgeable about OAIR policies especially submission policy which directs them to submit or self-archive their scholarly publications in the OAIRs. Therefore, the university management and the library should continue to create more awareness and advocacy on the rules and regulation for academic staff members to contribute their research outputs in OAIRs.

Table 5.1: Working experience of the respondents (n=292)

Working experience of the respondents	Frequency	Per cent
1-5	78	26.7
6-10	68	23.3
11-15	75	25.7
16-20	36	12.3
21-25	17	5.8
>26	18	6.2
Total	292	100.0

Source: Field Data (2020)

4.2 Presence of OAIR submission policy

Table 5.3 shows the availability of the OAIR submission policy where the respondents were asked to indicate whether their universities have the OAIR submission policy. Findings indicated that 46.2 per cent of the respondents indicated their universities have the OAIR submission policy. This implies that academic staff members were not aware that their universities had the OAIR submission policy. The presence of OAIR submission policy is very important as it provides faculty members with the opportunity of becoming aware of their rights to contribute their scholarly publications to OAIRs. Libraries should therefore continue to raise awareness and advocacy on OAIR submission policy, especially on authors' rights such as copyright and submission issues. Results on the presence of the OAIR submission policy were found to have a statistical significance difference at a 1 per cent level of significance ($p\text{-values} \leq 0.000$). Similar findings were reported in a study by Sankar and Kavitha (2017), and Akparobore and Omosekejimi (2020) who revealed that most universities had IR policies. However, contrastive result is reported in a study by Koulouris *et al.* (2013) who found that academic staff members are

aware of the OAIR submission policy and willing to submit content and publish in OAIRs; they also trust that OAIRs are needed for university activities and research visibility.

Accordingly, one key informant had this to say,

“Most of the academic staff members are not aware of OAIR submission policy” (MU, 2019).

The results from qualitative findings imply that most of academic staff are not aware of OAIR submission policy hence it was difficulty to submit or self-archive their scholarly publications in OAIRs. Therefore, Library Management should create more awareness on the rules and regulations for academic staff to submit or self-archive their scholarly publications in OAIRs.

Table 5.2: Awareness of OAIR submission policy among academic staff members

Awareness of OAIR submission policy among academic staff members	Yes	No	Total	P value
	135(46.2%)	157(53.8%)	292(100%)	0.000

Source: Field Data (2020)

4.3 The use of OAIR submission policy in the collection of OAIR contents

Table 5.4 shows the use of the OAIR submission policy in the collection of OAIR contents. The respondents were asked to indicate whether OAIR submission policies are used to direct them to submit their scholarly publications in OAIRs. The results show that 45.5 per cent indicated that OAIR submission policy is used to direct academic staff to submit their scholarly publications in OAIRs. This implies that submission policy exists and directs academic staff members to deposit immediately their scholarly publications in university OAIRs. For example, in MUHAS, SUA,

UDSM AND MU, academic staff members and students are obliged to deposit peer-reviewed articles in university OAIRs. However, the UDSM does not have a policy on the submission of scholarly literature in university OAIRs but they encourage their faculty members to submit their scholarly publications in the university OAIRs. In addition, Mzumbe University has reviewed its IR policy but has not yet published it.

Therefore, university should make sure that a submission policy is implemented to ensure that all academic staff members are submitting their scholarly publications in the university OAIRs. In addition, intellectual property rules for the scholarly publications deposited in OAIRs should be included in the OAIRs policy. A similar observation is made by Ukwoma and Dike (2017) that the policy should state that OAIRs are for preservation and self-archiving of scholarly articles of academic staff members.

One key informant had this to say,

“Submission policy should be well implemented for academic staff members to submit their scholarly publications in OAIRs” (MU, 2019).

The results from qualitative findings imply that submission policy enhances self-archiving and submission of scholarly publications in OAIRs. Therefore, submission policy should be well implemented for academic staff members to submit their scholarly publications in OAIRs.

Table 5.3: Use of OAIR policies in the collection of content in OAIRs

Use of OAIR policies in the collectio n of content in OAIRs	Yes	No	Don't know	Total	P valu e
	133(45.5 %)	188(40.4 %)	41(14. 0)	292(100 %)	0.00 0

Source: Field Data (2020)

4.3.1 Support of the use of OAIR submission policy in the collection of OAIRs content

Table 5.5 shows the academic staff members who support the use of OAIR submission policy in the collection of OAIRs contents. The study wanted to know whether academic staff members support the OAIR submission policy. Findings show that 46.2 per cent of the respondents reported supporting the OAIR submission policy. Among them, 85, which equals 29 per cent indicated supporting the submission policy, 30 (6.8 %) supported the preservation policy and 20(10.4%) supported the access policy. This implies that most academic staff members supported the submission policy that mandates them to deposit research publications in OAIRs. This provides academic staff members with the opportunity to self-archive their scholarly works and for libraries to collect more content in the university OAIRs. Therefore, Library Management should continue to emphasize the submission policy that mandates academic staff members to deposit their scholarly publications in OAIRs. According to the findings, the support of academic staff

members of the OAIRs policy that mandates self-archive was found to have a statistically significant difference at a 5 per cent level (p-values ≤ 0.05). This finding is similar to the findings reported in a study by Kakai (2018) and another by Chilimo (2015) who revealed that academic staff members in Kenya are in favour of a university policy that requires staff to deposit their research output to the OAIRs.

One key informant reported the following,

“Most academic staff members support the OAIR submission policy that mandates them to submit their scholarly publication in OAIRs” (SUA, 2019).

The results from qualitative findings imply that most academic members of staff support the OAIR policies that mandate them to submit their scholarly publications in OAIRs.

Table 5.4: Support from academic staff members on OAIR submission policy (n=292)

	Yes	No	Total	Pvalue
Support from academic staff members on OAIR policies				0.020
Access policy	135 (46.2%)	157 (53.8%)	292 (100%)	
Submission policy	20(6.8%)	272 (93.25%)		
Preservation policy	85(29%)	207 (70.9%)		
	30(10.4%)	262 (89.7%)		

Source: Field Data (2020)

4.3 Factors influencing the use of OAIR policies in the collection of content in OAIRs

The study used the UTAUT Model to investigate the factors influencing the use of OAIRs policies in the collection of content in OAIRs. Table 5.6 shows the factors influencing the use of OAIR submission policy in the collection of the contents of OAIR. The results indicate motivation, technical aspects, supervisors, colleagues and OAIRs policies as having an impact on the use of OAIRs for staff submission of their publications (all the p-values are greater than 0.05). This implies that all the factors cited above including OAIR submission policy have an equal contribution to the use of OAIRs to submit the content in the content in OAIRs. Elsewhere, it has been reported that motivational factors and OAIR policies are influence the use of OAIRs especially in depositing contents in OAIRs (Ukwoma and Dike, 2017). OAIR policies necessitated the submission of contents in OAIRs by academic staff members.

Similar findings are reported in a study by Bojelo (2020) who revealed that OAIR policy, the use of the internet, and ICTs facilities have simplified the use of OAIRs in sharing of scholarly publications. Therefore, the university should make sure that facilitating factors are available to encourage academic staff members to use OAIRs to deposit or contribute more content in OAIRs. In addition, technical factors such as procedure manuals and guidelines should be available to enable submission. Supervisors should encourage colleagues and students to submit their scholarly publications.

These extracts show observations from six key informants, *“Most of the academic staff members have low levels of awareness of OAIR submission policy, which is why they don’t*

submit their scholarly publications because they don't know their rights" (MU, 2019).

"My university lacks a self-archiving policy that specifies what should be included and what format is needed, which is why academic staff members failed to submit or self-archive their scholarly publications in university OAIRs" (UDSM, 2020).

"Most universities lack enough training on how to self-archive, which is why academic staff members failed to follow directions found in the university OAIRs policy" (MUHAS, 2020).

"The university OAIRs policy is not visible to the university community" (MU, 2020).

The results from qualitative findings imply that there is low level of awareness, lack of self-archiving policy and lack of submission policy, which impede self-archive and submission of scholarly publications by academic staff members to OAIRs.

Table 5.5: Factors influencing the use of OAIR policies in the collection of content in OAIRs

Variables	Parameters							
	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B) Lower Upper	
Motivating factors	41.380 ⁻	42281.473	.000	1	.999		.000	.000
Technical factors	-2.409	23506.463	.000	1	1.000		.090	.000
Supervisors and colleagues	38.367	17729.896	.000	1	.998	45990583907158384	.000	.000
ICT infrastructures	22.614	17971.604	.000	1	.999	6623201670	.779	.000
* OAIRs policy	22.614	17971.604	.000	1	.999	6623201670	.779	.000
Constant	36.771 ⁻	31900.362	.000	1	.999		.000	.000

Source: Field Data (2020)

Note* OAIR policy influenced the usage of OAIRs and was statistically significant at a 5 per cent level of significance ($p \geq 0.000$).

4.4 How the OAIR Submission Policy Policies can be used to improve the collection of OAIR Contents

Table 5.7 shows how the OAIR submission policy can be used to improve the collection of OAIR Contents. The results indicate in order to improve the collection of OAIR contents, 24.5 per cent of the respondents cited regular awareness creation of the rules and regulations on how to submit in OAIRs as an important strategy. About 18.5 per cent of the respondents suggested that effective implementation of OAIR submission policy for academic staff members to submit their papers in the university OAIRs is a strategy. About 16.3 per cent of the respondents suggested for an increase of OAIR policy visibility and accessibility through uploading OAIR submission policy to the university homepage. About 14.8 per cent suggested that OAIRs submission policy be strengthened to encourage submission. About 11.1 per cent suggested that OAIR submission policy should have a provision of mandating academic staff members to submit in OAIRs, 7.4 per cent wanted an assurance that OAIR submission policy is friendly to publishers and depositors. Lastly, 7.4 per cent suggested that OAIR submission policy should be formulated by librarians.

This implies that these universities have OAIR submission policy that is not well-implemented thus denying academic staff of the opportunity to submit their scholarly publications. Therefore, Library Management should implement the strategies and should ensure that such strategies are enforced and used for improving the growth of content in OAIRs.

Similar findings are reported in a study by Kodua-Ntim and Fombad (2020) who revealed that university libraries should use a strict policy regarding copyright issues and the quality of content and

should formulate policies for the submission of all types of intellectual output, including research articles mandatory. Similarly, Okorama (2018) recommends that there should be a workable policy guiding copyright matters and their implementations.

In addition, one key informant had this to say,

“Without a policy to direct users to submit or self-archive, OAIRs may remain virtually empty without content” (MU, 2020).

The results from qualitative findings imply that submission policy is important in enhancing self-archive and submission of scholarly publications in OAIRs. Therefore, submission policy should direct academically staff members to submit their scholarly publications in OAIRs.

Table 5.6: OAIR policies and the improvement of OAIRs content

How OAIR policies can be improved to enhance the growth of content in OAIRs	Frequency	Percentage (%)
Awareness on the rules and regulation OAIR policy on how to submit in OAIRs should be created from time to time	33	24.5
OAIR policy should effectively implemented to academic staff members to submit in the university OAIRs	25	18.5
The OAIR policy should be visible OAIRs and also made accessible through the university website	22	16.3
OAIRs submission policy should be clear between the author and the institutional that operating the OAIRs	20	14
OAIR submission policy should direct clearly academically staff to submit their scholarly publications	15	11.1
Ensure OAIR policies are friendly to publishers and depositors	10	7.4
OAIR policy should be formulated by librarians	10	7.4

Source: Field Data (2020)

5.0 Fitness of the model

The study used the UTAUT model and modified some variables to suit the study. The study modified voluntariness (moderator) and the use of OAIRs policies as this was deemed important in the growth of OAIRs. The study results revealed that the use of the OAIRs policies influences the usage of OAIRs and this was

statistically significant at a 1 per cent level of significance ($p \geq 0.000$).

6.0 Conclusion

The study investigated how the use of the OAIR submission policy can improve the content in OAIR in Tanzania. Findings revealed that few respondents were aware of the OAIR policy. Furthermore, the study found that the OAIR submission policy directs academic staff members to submit their scholarly publications in OAIRs. In addition, the study found that awareness on the rules and regulation should be created from time to time, academic staff members should be mandated to submit their scholarly publications in the OAIRs, OAIRs submission policy should be placed on the OAIRs homepage and made accessible through the university website; these could improve the growth of contents in OAIRs. Therefore, the study concluded that the OAIR submission policy is vital and has a positive influence on the growth of content in OAIRs; without a policy, OAIRs may remain almost empty.

7.0 Recommendations

Based on the study results, the researcher recommends that,

- The universities and Library Management should make sure that they have an OAIR submission policy that directs academic staff to submit or self-archive scholarly publications in OAIRs.
- The universities and Library Management should make sure supervisors, departments and faculties spearhead awareness on the use of OAIR submission policy among academic staff members and students.
- The universities and Library Management should make sure OAIR submission policy is emphasized in areas such as submission where faculty members should be mandated to submit their scholarly publications in; the university OAIRs to increase the number of contents in OAIRs.

8.0 Area for further research

The study suggested that there is need to carry out further in-depth study to find out other factors, which can be used to enhance submission/self-archiving of scholarly produced content in OAIRs rather than OAIRs policy.

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5.0 CHAPTER FIVE

Usage patterns of Open Access Institutional Repositories in Tanzania

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Usage patterns of Open Access Institutional Repositories in Tanzania: A Case of Selected Public Universities

ABSTRACT

The purpose of this study was to investigate the usage patterns of OAIRs among university community members in Tanzania universities. The Unified Theory of Acceptance and Use of Technology (UTAUT) model used to guide this study. The study employed a cross-sectional research design. Systematic random and purposive sampling procedures were used to obtain a total of 292 respondents and eight key informants respectively. Questionnaires and interviews were used to collect quantitative and qualitative data. Quantitative data were analyzed by using SPSS and qualitative data were analyzed by using content analysis. The study found that 54.5% of the respondents indicated the use of OAIRs are to collect, preserve and disseminate scholarly publications and 54.5% to provide information resources for teaching, learning, and research. The study found that faculty members are using OAIRs very often. 66.4% of the respondents indicated that factors motivate to use OAIRs are to enjoy access to articles without hindrance and charges, 54.5% provisional of open access to a wider audience of researchers and 47.4% to increase the impact of researchers' work. The study found that challenges influencing the use of OAIRs are low level of awareness, lack of ICTs infrastructure and lack of skills in using OAIRs. The study concludes that there is still much to be done in Tanzanian universities to improve the extent of OAIRs usage. The study recommends for provisional of skills in using OAIRs, stable ICTs facilities such as enough computers, Internet, and creation of more awareness on the use of OAIRs.

Keywords: Open Access Institutional Repository (OAIRs), scholarly publications, faculty members, institution's community members, university's community members, Tanzania

1.0 INTRODUCTION

Traditionally, scholarly publications created by institutions' community members and researchers were collected and preserved in the university library, others were preserved by authors themselves in their drawers while others were dumped in the various departmental offices (Mohammed, 2013). As a result, their visibility and use were very limited. With the advent of Information and Communication Technologies, digital systems are effectively

replacing manual systems in storing and preserving scholarly publications. Among the commonly used digital systems in managing digital content are the Open Access Institutional Repositories (OAIRs). These repositories enhance the preservation and visibility of scholarly publications.

Sang and Odi (2021) and (Kayungi and Manda 2021) define OAIRs as the digital archive for collecting, preserving, managing, and disseminating digital materials produced at an institution. Through OAIRs scholarly publications created by faculty members can now be captured, managed, preserved, and disseminated freely within and outside the institutions if they have access to the internet, with few (if any) barriers.

OAIRs were introduced around the world in the 2000s. In Europe, OAIRs were introduced at different times and rates in the early 21st century (Sain, 2018 Nunda and Elia 2019). In Africa, OAIRs were introduced in the 2000s and the first country to introduce OAIRs was South Africa in 2000 (Kakai 2018). In East Africa, OAIRs were introduced in 2006 (Kakai, 2018). Now, most African universities have OAIRs but are still in the intermediate stages. By 2022, there were 72 OAIRs in East Africa registered in the Directory of Open Access Repositories (OpenDOAR).

OAIRs are important in institutions and to institutional communities. The university uses OAIRs to collect, preserve and disseminate scholarly publications to the community. OAIRs are used by faculty members to access and download articles and other information resources for academic purposes such as teaching, research, and learning and to self-archive scholarly publications. OAIRs are also used as methods of sharing research outputs among intellectuals, used as publication outlets and as long-term preservation of digital scholarly publications, and used as a collaboration mechanism with other faculty members, (Gohain and Angadi, 2020; Akparobore and Omosokejimi, 2020; Bamigbola and Adetimirin, 2018 and Kakai, 2018).

Moreover, OAIRs are widely used for various reasons depending on the interest of the faculty member. According to Okumu (2015), Europe, Asia, America, and Australia have higher usage of OAIRs compared to other developing countries. Contrary to African countries OAIRs has recorded underutilized by faculty members (Fasae *et al.* 2017). OAIRs in Africa have not been promising in terms of usage and growth (Nwakaego, 2017).

In Tanzania, OAIRs were introduced in 2012 with the aim of facilitating the collection, preservation, and archival of scholarly assets created by academics within academic and research institutions (Muneja and Sichwale, 2016). At the time the study was conducted, Tanzania had 14 OAIRs and was marked 4th among African nations with OAIRs (OpenDOAR, 2020). OAIRs were first adopted and used in 2009 at the University of Dar es Salaam (UDSM), followed by Mzumbe University (MU) in 2010, Sokoine University of Agriculture (SUA) in 2011, and Muhimbili University of Health and Allied Sciences (MUHAS) in 2012 and later followed by other universities. Despite the potential use of OAIRs, still, OAIRs in Tanzania has not yet been fully explored by potential users (Nunda and Elia, 2019). Therefore, the purpose of this study was to investigate the usage patterns of OAIRs among institutions' community members in Tanzanian universities.

1.1 Statement of the problem

In Tanzania, OAIRs enhance the collection, preservation, and dissemination of scholarly publications. A number of studies (e.g Kayungi and Manda 2021; Mbughuni *et al.*; 2021, Mwalubanda 2021; Nunda and Elia, 2019; Mnzava and Chirwa, 2018 and Malekani and Kavishe, 2018) have been conducted on OAIRs in Tanzania. These studies have investigated the awareness of IRs, the extent to which academic staff are engaged in depositing locally produced content in OAIRs, the growth of IR in the East African region, the adoption and use of IRs among postgraduate students, and the use of Sokoine University of Agriculture Institutional Repository (SUAIR). Yet the study to investigate the usage patterns of OAIRs among university community members in Tanzanian universities are limited and have not deeply focused on how OAIRs are used by university community members, the extent of usage of OAIRs, motives for using OAIRs, and challenges influencing the usage of OAIRs. Hence limiting the realization of a deeper understanding of the aspect. Therefore, this study sought to investigate the usage patterns of OAIRs among university community members in Tanzanian universities.

1.2 Objectives of the study

The purpose of this study was to investigate the usage patterns of OAIRs among university community members in Tanzania universities. Specifically, the study sought

- To investigate how OAIRs are used by university community members in selected universities

- To examine the extent of usage of OAIRs in selected universities
- To determine motives for using OAIRs among university community members in selected universities
- To determine challenges influencing the usage of OAIRs in selected universities

1.1 Research questions

The research questions of this study were:

- How OAIRs are used by university community members in selected universities?
- What are the motives for using OAIRs among university community members in selected universities?
- What is the extent of OAIRs usage in selected universities?
- What are the challenges influencing the usage of OAIRs in selected universities?

1.2 Contribution of the study to the scientific discipline

This study explains the usage patterns of OAIRs among university community members in Tanzania universities. From the findings, the university and library management will understand how OAIRs are used by university community members. This will give a chance to understand what to be done for university community members to continue using OAIRs. Also, university and library management will understand the extent to which faculty members use OAIRs and find a way to improve the usage to more frequent usage. Furthermore, the study finding will enable the university and library management to improve motives that cause faculty members to use OARs also challenges emanating from the study on the use of OAIRs among faculty members will be improved following strategies mentioned in this study.

2. REVIEW OF LITERATURE

The literature review is arranged according to the specific objectives of the study including the use of OAIRs by the university community, the extent of usage of OAIRs, motives for using OAIRs among university community members, and challenges influencing the usage of OAIRs.

2.1 Use of OAIRs and extent of using OAIRs

The use of OAIRs is very important for the sustainability and growth of OAIRs. in this light, Okumu (2015) and Ukwoma and Dick (2017), expressed that OAIRs are used by institutions

to collect, preserve and disseminate digital copies of the intellectual output of an institution, particularly a research institution. OAIRs are used as a forum where faculty members can collaborate with other colleagues within and outside the university by sharing their academic works. Also, OAIRs are used as a store for the preservation of scholarly works for the long term and are used to disseminate or provide access to scholarly publications free without any barriers.

Furthermore, Fasae *et al.* (2017) and Chewe *et al.* (2021) noted that OAIRs are used by faculty members as a platform for self-archiving academic works, to access information for teaching students and get information on the relevant research area, and as a method of sharing content to a different audience.

Despite the importance obtained from using OAIRs still extent of using OAIRs among faculty members is still low in different countries (Saini, 2018 and Fasae, *et al.*, 2017). Ebele (2019) revealed that the majority of faculty members use OAIRs very rarely, as a result, most of the OAIRs lack enough content and have low attitudes among faculty members towards the use OAIRs.

Truthfully, the implication is that the use of OAIRs among faculty members is influenced by different challenges and challenges are the major issue that hinders the success of OAIRs (Dutta and Paul, 2014 and Nwakaego, 2017). However, it is not yet fully understood the way OAIRs are used in most higher learning institutions (Kakai 2021, Kayungi and Manda 2021; Bojelo 2020; Bamigbola and Adetimirin 2018).

2.2 Motives for using OAIRs among university community members

Nwachi and Idoko (2021) found out that faculty members are motivated to use OAIRs because they desire to increase the institution's visibility and prestige, they want to store their intellectual publications, they want to use the content for teaching, learning, and research and they want to use as a channel for scholarly communication. Anenene *et al.* (2017), also discovered that the contributors who are the faculty members are motivated to use OAIRs because they benefit by enjoying access without hindrance and charges, open access to a wider audience of research, self-archiving, and increasing citations of their academic works. This implies that faculty members have a lot to gain by using OAIRs.

Furthermore, Gunasekera (2017) found out that faculty members are motivated to use OAIRs because they support the principle of Open Access, use it as a good way of disseminating their work, make their work visible to other universities and desire to be involved with innovative technology and to get feedbacks or commentary from others. Musa *et al.* (2016) also discovered that academic librarians are motivated to use OAIRs because they want their research to be wider visibility, collaboration, self-archiving, recognition, and prestige. These studies however provide valuable insights into motives for using OAIRs among university community members in other countries.

2.3 Challenges influencing the usage of OAIRs

Institutions worldwide have established OAIRs to disseminate their institutional intellectual capital, however, the use of OAIRs remains an aspect with different challenges. Different studies found that academic staff are not aware of the university OAIRs (Fasae and Adekoya, 2021 and Sang and Odini, 2021). This is a big challenge across all African countries that OAIRs are established but faculty members who are the authors are not aware of the OAIRs. Moreover, different universities have tried to create awareness through advocacy on OAIRs, conducting seminars, workshops, and orientations but still, awareness is a big problem among faculty members. Sang and Odini (2021) revealed that the majority of faculty members are still not aware of OAIRs in their universities.

Other challenges that hinder the usage of OAIRs were revealed by Nwachi and Mole (2020); Nwokedi and Nwokedi (2018); Karanja (2017) and Ratanya (2017) who found that poor internet connectivity, epileptic power supply, and lack of contents of interest are challenges hinder usage of OAIRs. These challenges are mainly found in African countries where different institutions tried to address the strategies to eliminate but most of them still exist in some institutions.

Kakai (2021); Bojelo (2020); Bamigbola and Adetimirin (2018); Adam and Kaur (2021) and Gonzalez-Perez *et al.* (2021) found that faculty members lack technical skills, inadequate infrastructure to use OAIRs, scarcity of research outputs in their field and existence of abstracts rather than full texts, negative perception that OAIRs contents are of low quality, fear of copyright infringement and plagiarism were also the challenges that hinder usage of OAIRs.

Abrizah (2009) summarizes that challenges hindering OAIRs usage are common in African countries and cause faculty members not to use OAIRs and most of the challenges found are not technical implementation but culture hence limiting the use OAIRs. The central question, therefore, is whether the same challenges are facing the use of OAIRs in Tanzania and what would be the remedies to minimize these challenges. Empirical literature from other studies has suggested that in order to increase the number of contents in OAIRs the institution concerned should offer monetary incentives for authors who deposit their work in the OAIRs, this will encourage OAIRs usage (Tapfuma and Hoskins, 2019). Also, Akporhonor and Olise (2015), suggested that the institution should promote research outputs archived in OAIRs to allow easily discoverable by others who wish to use them. Also, Fasae and Adekoye (2021) suggested that for successful use of OAIRs, librarians and institutional repository managers must build awareness among faculty members.

The review of literature on the use of OAIRs by the university community, the extent of usage of OAIRs, motives for using OAIRs among university community members, and challenges influencing the usage revealed that the author has tried to identify some issues from other continents such as Europe, America, and Africa as well. As this matter, it is important to carry out this study in Tanzania to investigate the usage patterns of OAIRs among university community members.

3. THEORETICAL FRAMEWORK AND CONCEPTUAL FRAMEWORK

3.1 Theoretical framework

Different models and frame work have been developed to explain user adoption of new technologies. These models introduce factors that can affect the user acceptance. These models include Technology Acceptance Model (TAM), Theory of Planned Behavior and Diffusion of Innovation theory (TPB), Theory of Reasoned Action (TRA), Model of PC Utilization, Motivational Model (MM), Unified Theory of Acceptance and Use of Technology (UTAUT) and Social Cognitive Theory (SCT). These theories have been used by different studies to conduct their researches by combining previous models or add new constructs to develop models to carry out their studies (Venkatesh *et al.*, 2003).

The study decided to adopt the Unified Theory of Acceptance and Use Technology (UTAUT) model to guide the study. The model is adopted because is found to be suitable, have constructs which fit the study also is flexible can be modified or add new constructs to fit the study.

The UTAUT model states that behavioral intention to use technology is determined by four constructs which are performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh, *et al.*, 2003). These determinants of technology usage behaviour are moderated by age, gender, experience and voluntariness (Onaolapo and Oyewole, 2018 and Venkatesh *et al.*, 2003).

Performance expectancy is concerned with the extent to which users (academics and researchers) of an installed system believe that they will realize gains in work performance when they use the technology. It is moderated by gender and age. Effort expectancy is concerned with the degree of ease of use of the system and is moderated by gender, age and experience. Social influence is concerned with the degree to which a person believes that members of a reference group (e.g. workmates or the academic community) believe they should use the new system. It is moderated by gender, age, experience and voluntariness. Lastly, facilitating conditions are concerned with the degree to which a person believes that an organizational and technical infrastructure exists to support the use of the system. Its influence on the usage of a system is moderated by age and experience constructs (Ghalandari, 2012 and Venkatesh *et al.*, 2003).

3.2 Conceptual framework

The UTAUT model adopted was modified and formulated the conceptual framework to guide the study. Therefore, motivating factors, the influence of technical support, the influence of colleagues/peers/supervisors, and the influence of ICTs infrastructure were used to determine the use of OAIRs among faculty members.

In the context of this study motivating factors mean the degree to which faculty members perceive that the use of OAIRs will enable them to improve their academic activities. The influence of technical support of use means the degree to which faculty members find it easy or complex to use OAIRs within the shortest time possible. The influence of colleagues/peers/supervisors means the way academic members feel that other people believe them to use OAIRs. The influence of ICTs infrastructure means the degree to which faculty members believe that the university resources and technical infrastructures exist to support the use of OAIRs for improved usage patterns.

Therefore, motivating factors, the influence of technical support, and the influence of colleagues/peers/supervisors, and the influence of ICTs infrastructure is the independent variable. OAIRs usage is the dependent variable. Gender, age, working experience, and level of education are the moderators. Voluntariness was replaced by a level of education because it was found very important variable in the use of OAIRs. The conceptual framework of this study is presented in Figure 1

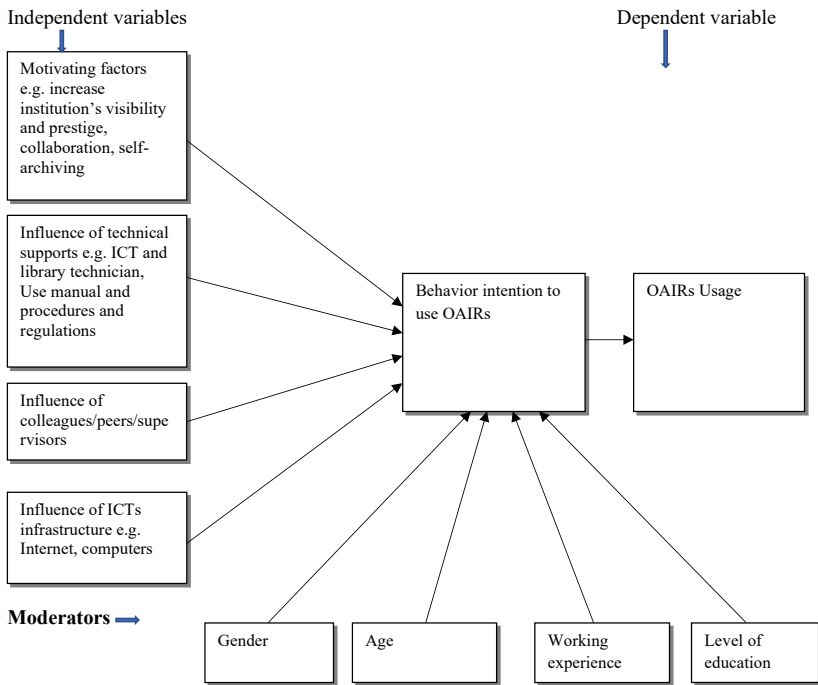


Figure 1: Conceptual Framework for the study

The research conceptual framework hypothesized that independent variables and moderators have a significant relationship with the behavior intention to use OAIRs.

4.0 METHODOLOGY

4.1 The study university

The study universities were four selected public universities in Tanzania namely: the Muhimbili University of Health and Allied Sciences (MUHAS), Mzumbe University (MU), Sokoine University of Agriculture (SUA), and the University of Dar es Salaam (UDSM). These four public universities were selected based on the criteria that they have operational OAIRs and that their OAIRs are old enough to offer insights and data for the present study. Moreover, these OAIRs have been registered by Open DOAR which was thought also to offer substantial secondary data for the study.

4.2 The Research design

The research design adopted by this study was a cross-sectional research design. The design was selected because it allows us to compare many different variables at the same time. Also, the method of collecting data under this design is faster and less expensive (Mainer, 2016).

4.3 The population and sample size

The population for this study was 2894 respondents who were faculty members from four selected public universities. Respondents were academic staff including professors, lecturers, and trainees.

4.3.1 The sample size

The sample size was obtained by using Slovin's formula ($n=N/(1+Ne^2)$)

Where "n" is the sample size, "N" is the total population (2894) and "e" is the margin of error (0.05). Therefore, $2894/(1+2894*0.05*0.05) = 2894/2895*0.0025 = 2894/7 = 413$ (see the sampling frame table I).

Table 1: Sampling frame

University	Academic staff population (N)	The proportion from the required 'n' (N/2894) * 413
MUHAS	693	99
MU (Main campus)	236	34
SUA (Only Main campus and SMC)	427	61
UDSM (Main campus)	1538	219
Total	2894	413

Source: Field Data (2020)

Therefore, out of the sample size (413), 34 faculty members were drawn from MU, 219 from UDSM, 61 from SUA, and 99 from MUHAS.

4.4 Sampling techniques

The study used systematic random sampling and purposive sampling techniques to select representatives for this study.

4.4.1 Systematic random sampling

A systematic random sampling technique was used to obtain representatives from each university. Every 6th faculty member was picked from the list of faculty members in selected universities. Systematic sampling was used because it is simple and reduces the risk of bias.

4.4.2 Purposive sampling

Purposive sampling was used to obtain 8 key informants who were heads of departments, ICT, and library technicians. Key informants selected were the ones who are involved in managing OAIRs in their universities.

4.5 Data collection methods

4.5.1 Quantitative primary data

These data were collected by using a structured questionnaire administered to 413 institutions' community members. 292 questionnaires were successfully and correctly filled and returned making a return rate of 70.7%. Out of 292 who return the questionnaire, 158 respondents indicated using scholarly publications archived in OAIRs.

Table 2: Respondents by the university (n=292)

University	Frequency	Percent
MUHAS	77	26.4
MU	47	16.1
SUA	43	14.7
UDSM	125	42.8
Total	292	100.0

Source: Field Data (2020)

4.5.2 Qualitative primary data

These data were collected during the in-depth interviews with key informants (four heads of departments, two ICT technicians, and two library technicians), documentary review, and

observation was read expansively to get the right interpretation and understanding of what they implied concerning the topic of investigation. Key informants were thought to be knowledgeable and involved in managing OAIRs.

4.5.3 Secondary data

Secondary data were collected by reading from documentary sources including;

- Universities OAIRs policies documents to get insights on policies guiding the usage of OAIRs,
- Existing literature on OAIRs policies to get it clear on how different policies from other institutions compare with those formulated by universities under study,
- The Directory of Open Access Repositories (OpenDOAR) to get statistics on the number of documents deposited in OAIRs, and
- The Registry of Open Access Repositories (ROAR) to get statistics on the number of documents deposited in OAIRs.

4.6 Data analysis

Data were analyzed according to the specific objectives.

4.6.1 Quantitative data analysis

Quantitative data were analyzed by using SPSS software Version 22. Descriptive statistics were calculated to obtain frequencies and percentages for example table 2. Furthermore, objectives number one to four were analyzed by using inferential statistics where data were cross-tabulated to generate p-values that were used to determine the relationships among variables and ascertain the presence or absence of any statistical significance difference among the variables compared.

4.6.2 Qualitative data analysis

Qualitative data was analyzed by using content analysis. Data obtained from universities' OAIRs policies, existing literature on OAIRs usage, the Directory of Open Access Repositories (OpenDOAR), and the Registry of Open Access Repositories (ROAR) were prepared and organized, reviewed and explored, create initial codes, combined into themes. The obtained themes were categorized according to the specific objectives and research questions. The verbatim quotations from respondents' views were taken into consideration and placed under

the respective themes. This means that the analysis followed a pattern that matched the methods before conclusions were drawn from the findings. This process was done through the content analysis approach and then presented by explanation.

5.0 RESULTS AND DISCUSSIONS

The results and discussion will be presented according to specific objectives.

5.1 Demographic characteristics of respondents

Figure 2 presents the gender of the respondent. It shows that 60.3% were male and 39.7% were female. The implication is that a larger percentage of respondents involved in this study were male faculty members who seem to be faster adopters and users of technology and also users of electronic resources compared to females (Smith, 2015). Therefore, the faculties and library management should think of increasing OAIRs awareness among female faculty members and others who are not aware of OAIRs. This can be done by advocating the OAIRs through using brochures, conducting workshops, seminars, and conferences.

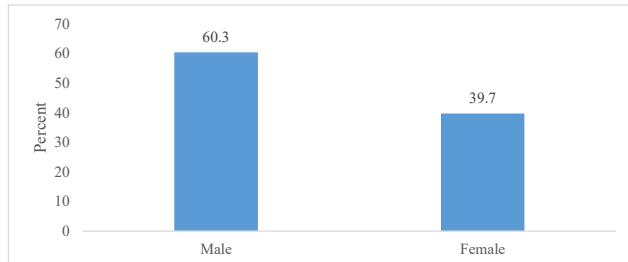


Figure 2: Distribution of respondents by Sex (n=292)

Source: Field Data (2020)

Figure 3 presents the age of the respondent. It shows that 37.7% of the respondents had 36-45 years old and 28.1% had 20-35 years old. The implication is that faculty members in this study are aged enough to use OAIRs for different academic activities. Therefore, the university and library management should continue to create awareness of the availability of OAIRs in the university through marketing strategies such as using brochures, flyers, etc.

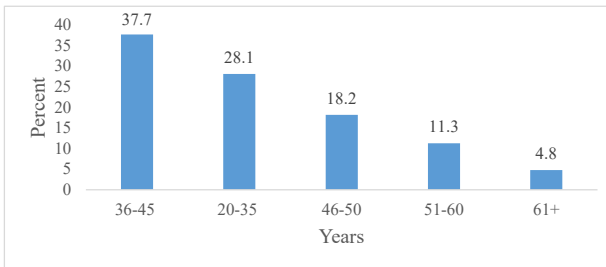


Figure 3: Distribution of respondents by age (n=292)

Source: Field Data (2020)

Figure 4 presents the academic qualification of the respondents. It shows that 45.5% of the respondents had a Master's Degree and 33.6% Ph.D. The implication is those faculty members involved in this study are well-educated to use university OAIRs for academic purposes. Therefore, the university and library management should continue to create more awareness and impact skills for faculty members to use the OAIRs. Also, should promote research output uploaded in OAIRs for easily seen by others.

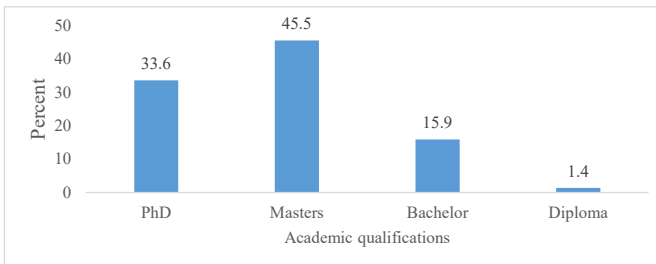


Figure 4: Distribution of respondents by academic qualifications (n=292)

Source: Field Data (2020)

Figure 5 presents the working experience of the respondents. It shows that 78% of the respondents have working experience of 1-5 years, 75% have 11-15 years, and 68% have 6-10 years. 36 have 16-20 years, 18% have 26 and above and 17% have 21-25. The implication is those faculty members involved in this study have enough working experience to use university OAIRs for academic purposes. Therefore, the university and library management should

continue to create more awareness of the usage of university OAIRs. Also, provide training on the importance of OAIRs in their research activities and educate on issues such as intellectual rights, scholarly communication, and copyright issue to encourage faculty members to use OAIRs.

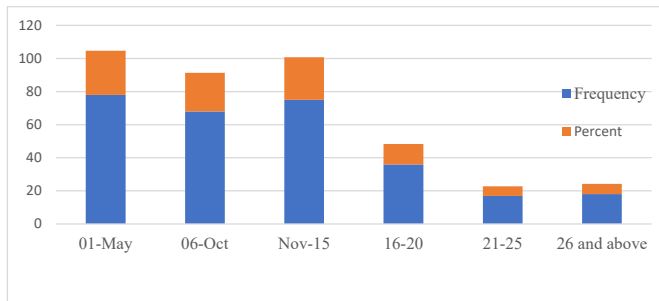


Figure 5: Distribution of respondents by working experience (n=292)

Source: Field Data (2020)

5.2 Use of OAIRs

Table 3 shows the use of OAIRs by the university. The respondents were asked to indicate if they use OAIRs or not. Results show that out of 292 faculty members, 158 faculty members indicated to use of OAIRs. 32.3% of respondents were from the University of Dar es Salaam, followed by the Muhimbili University of Health and Allied Sciences (28.5%), Sokoine University of Agriculture (22.2%), and Mzumbe University (17.1%). The implication is that few faculty members are using OAIRs, this could be due to a lack of awareness and other reasons. This result is different from other countries where Downing-turner (2022) revealed that most academic staff are using OAIRs to access and download different intellectual publications for their academic activities.

Therefore, the library management should make sure that they create more awareness of the use of OAIRs and the kind of scholarly publications uploaded in OAIRs. This can be done through marketing, advocacy, training, and orientations of new faculty members. Also, the library management should make sure they upload different intellectual publications according to the needs of faculties and inform faculty members of their availability. This will encourage faculty members to use university OAIRs.

The results of OAIRs use by faculty members have a highly statistically significant difference at a 1% level of significance ($p\text{-value} \leq 0.01$). The implication is that there is quite a big variation in terms of usage of OAIRs by faculty members, which could be due to differences in the use of OAIRs according to university academic needs, specializations, and disciplines.

Table 3: Use of OAIRs by the university (n=292)

UNIVERSITY	Use of university OAIRs		
	YES	NO	P-VALUE
The Muhimbili University of Health and Allied service	45(28.5%)	31(23.3%)	0.000
Mzumbe University	27(17.1%)	20(15.0%)	
Sokoine University of Agriculture	35(22.2%)	8(6.0%)	
University of Dar es salaam	51(32.3%)	74(55.6%)	

Source: Field Data (2020)

5.2.1 Usage of OAIRs

Table 4 shows the use of OAIRs. The respondents were asked to indicate the use of OAIRs. The results show that 66.4% of respondents indicate OAIRs are used to collect, preserve and disseminate scholarly publications, 54.5% to provide information resources to use for teaching, learning, and research work, 47.4% to enhance resources sharing, 46.9% to enhance collaboration among researchers, 46.9% to increase institution's visibility, 45.6% to make research output more visible, 41.8% to self-archive scholarly publications.

The implication is those faculty members who occur to use OAIRs understand the use of OAIRs, this could be due to awareness provided by librarians through different workshops, training, and orientations. The result is similar to the study done by Anenene *et al.* (2017) the majority of academic staff find it easy to use OAIRs.

Therefore, the library staff who are saddled with the responsibility of OAIRs should continue to create more awareness on the use of OAIRs and the kind of scholarly publications uploaded in OAIRs. This can be done through a series of conferences capacity-building workshops and, training. Also, the orientation of new faculty members. Also, the library management should

make sure they upload different intellectual publications according to the needs of faculties and inform faculty members on their availability. This will encourage faculty members to use university OAIRs.

Table 4: Use of OAIRs (n=158)

Use of OAIRs	Yes	Neutral	No	Not applicable	Total	p-value
To enhance resources sharing	75(47.4%)	48(30.4%)	32(20.3%)	3(1.9%)	158(100.0%)	0.000
To provide information resources to use for teaching, learning, and research work	86(54.5%)	42(26.6%)	26(16.5%)	4(2.5%)	158(100.0%)	0.000
To collect, preserve and disseminate scholarly publications	105(66.4%)	22(13.9%)	28(17.7%)	3(1.9%)	158(100.0%)	0.000
To self-archive scholarly publications	66(41.8%)	49(31.0%)	40(25.3%)	3(1.9%)	158(100.0%)	0.000
To enhance collaboration among researchers	74(46.9%)	35(22.2%)	46(29.1%)	3(1.9%)	158(100.0%)	0.000
Make research output more visible	72(45.6%)	37(23.4%)	46(29.1%)	3(1.9%)	158(100.0%)	0.000
To increase the institution's visibility	74(46.9%)	33(20.9%)	48(30.4%)	3(1.9%)	158(100.0%)	0.000

Source: Field Data (2020)

5.2.2 Availability of the scholarly publications uploaded in OAIRs

Table 5 shows the availability of the scholarly publications uploaded in the university OAIRs. The respondents were asked to indicate if the scholarly publications uploaded in OAIRs are enough and meet their academic desire. The results indicated that 54.4% of the faculty members who used scholarly publications uploaded in the university OAIRs indicated that the availability of scholarly publications uploaded in OAIRs is moderate. The implication is that OAIRs have few scholarly publications uploaded and also most of them do not meet users' needs. This is also reported in the study done by Muneja and Sichelwe (2016) who reported that academic staff in UDSM mentioned that several materials are not available in OAIRs and should be included. Therefore, the university and library management should make deliberate efforts to emphasize uploading missing scholarly publications in the university's OAIRs to meet the needs of the faculty members.

The results are found to have a high statistically significant difference at a 1% level of significance ($p\text{-value} \leq 0.01$). This shows that there is quite a big variation in terms of the availability of scholarly publications uploaded in OAIRs, which could result in differences in the academic needs of faculty members.

On the other hand, qualitative findings also indicated that the availability of the scholarly publications uploaded in OAIRs is not enough to meet faculties needs. One key informant explained:

“Scholarly publications uploaded in OAIRs are not enough which discourages academic staff to use the content available”. (March, 2020)

Table 5: Availability of the scholarly publications uploaded in OAIRs (n=158)

Availability of the scholarly publications uploaded in OAIRs	Not				p-value
	Sufficient	Moderate	Sufficient	Not sure	
	13(8.2%)	86(54.4%)	31(19.6%)	28(17.7%)	158(100.0%) 0.000

Source: Field Data (2020)

5.2.3 Kind of scholarly publications that are missing in universities' OAIRs

Qualitative findings indicated there are missing scholarly publications in the university OAIRs.

One key informant explained:

“Faculty members reported that scholarly publications that are missing in universities OAIRs are course syllabus, newsletter, project reports, and handouts”. (Sep, 2020)

“Faculty members reported that scholarly publications that are missing in universities OAIRs are articles of my field such as health reports and health project reports” (March 2020).

“Faculty members reported that scholarly publications that are missing in universities OAIRs are staff publications, architecture publications, project reports, and past papers”. (Jan, 2020)

The results are found to have differences from all four universities. The implication is that there is quite an indifference in terms the of kind of scholarly publications that are missing universities' OAIRs, which could be a result of differences in academic needs among the universities under study. This result is different from the study done by Fasae *et al.*, (2017), who revealed that the OAIRs have several contents according to the university curriculum and the university community fully utilizes the available contents.

Therefore, library management should make deliberate efforts to emphasize uploading missing scholarly publications in the university's OAIRs to meet the needs of the users.

5.3 Extent of using OAIRs and kind of scholarly publications used by faculty members

Table 4 shows the extent of using OAIRs the and kind of scholarly publications used by faculty members. The respondents were asked to indicate to what extent they use the OAIRs and the kind of scholarly publications used. The results indicated that most of the faculty members are using OAIRs very often, sometimes, and others have never used OAIRs. Kind of scholarly publications used journals articles (37.3%) and research reports and technical reports (29.7%) more often, book chapters (29.7%), and dissertations and thesis (25.9%) sometimes while conference presentations (29.7%), course syllabi (46.8%) and lecture notes, handouts and assignments (50.0%) were never used. The implication is that other faculty members are not aware of OAIRs and the availability of scholarly publications because the study found that there are scholarly publications that are never used. This is different from other countries where Nwachi and Idoko (2021) found out that faculty members are aware of the scholarly publications archived in OAIRs and are using them in their day-to-day academic activities.

For faculty members to use OAIRs and scholarly publications uploaded effectively and more often, awareness and uploading scholarly publications which meet users' needs are very important. Therefore, the library management should make sure their faculty members are aware of university OAIRs and upload scholarly publications according to the university advocating can be created through advocacy, seminar and workshop also orientation for new academic staff.

The results are found to have a high statistically significant difference at a 1% level of significance ($p\text{-value} \leq 0.01$). This shows that there is quite a big variation in terms of the extent of using OAIRs and the kind of scholarly publications used, which could be a result of

differences in the availability of scholarly publications according to the subject and their use according to academic needs and the type of the universities.

On the other hand, qualitative findings indicated the extent of using OAIRs the and kind of scholarly publications used by faculty members as claimed by one key informant who explained:

“Faculty members do not frequently access, download, and use scholarly publications in the university OAIRs” (Jan 2020)

Table 4: Extent of using OAIRs and kind of scholarly publications used by faculty members (n=158)

Scholarly publications	The extent using OAIRs and the kind of scholarly publications used by faculty members						p-value
	Always	Often	Sometime	Rarely	Never	N/A	
Journal articles	31(19.6%)	59(37.3%)	47(29.7%)	8(5.1%)	12(7.6%)	1(.6%)	0.000
Research reports/ technical reports	21(13.3%)	47(29.7%)	5(32.3%)	20(12.7%)	13(8.2%)	6(3.8%)	0.000
Book chapters	14(8.9%)	21(13.3%)	47(29.7%)	30(19.0%)	40(25.3%)	6(3.8%)	0.000
Dissertation/ Thesis	34(21.5%)	30(19.0%)	41(25.9%)	33(20.9%)	17(10.8%)	3(1.9%)	0.000
Conference presentations	13(8.2%)	26(16.5%)	37(23.4%)	31(19.6%)	47(29.7%)	4(2.5%)	0.000
Course Syllabi	13(8.2%)	11(7.0%)	24(15.2%)	31(19.6%)	74(46.8%)	5(3.2%)	0.000
Lecture notes, handouts, and assignment	10(6.3%)	17(10.8%)	27(17.1%)	20(12.7%)	79(50.0%)	5(3.2%)	0.000

Source: Field Data (2020)

5.4 Motive for use of OAIRs by faculty members

Table 7 shows the motive for use of OAIRs by faculty members. The respondents were asked to indicate the motive that makes them use OAIRs. The results show that faculty members are motivated to use OAIRs 66.4% desire to enjoy access to articles without hindrance and charges, 54.5% OAIRs provide open access to a wider audience of researchers, 47.4% desire to increase the impact of researchers' work, 46.9% accessibility and downloading of research work, 46.9% want to self-archiving published scholarly work, 45.6% desire to increased citation to published scholarly work among others and 41.8% want the reward and promotion.

The implication is that faculty members are motivated to use OAIRs to attain different academic goals. This is similar to the study done by Nwachi and Idoiko (2021) who revealed that faculty members use OAIRs for academic purposes. Therefore, the library management needs to upload different publications according to the needs of faculty members. For instance, the use of OAIRs may only be guaranteed in the presence of scholarly publications which fulfill the needs of faculty members.

On the other hand, qualitative findings indicated why faculty members use OAIRs. One key informant explained:

“Most of the faculty members reported that they are motivated to use OAIRs because they find different scholarly publications OAIRs to be used their academic purposes” (MU, Sep, 2020),

Table 7: Motive for use of OAIRs by faculty members (n=158)

The motive for use of OAIRs by faculty members	Yes	Neutral	No	Not applicable	Total	p-value
Desire to the increase impact of researchers' work	75(47.4%)	48(30.4%)	32(20.3%)	3(1.9%)	158(100.0%)	0.000
OAIRs provide open access to a wider audience of researchers	86(54.5%)	42(26.6%)	26(16.5%)	4(2.5%)	158(100.0%)	0.000
Desire to enjoy access to articles without hindrance and charges	105(66.4%)	22(13.9%)	28(17.7%)	3(1.9%)	158(100.0%)	0.000
Want reward and promotion	66(41.8%)	49(31.0%)	40(25.3%)	3(1.9%)	158(100.0%)	0.000
Accessibility and downloading of research work	74(46.9%)	35(22.2%)	46(29.1%)	3(1.9%)	158(100.0%)	0.000
Desire to increase citation to published scholarly work among others	72(45.6%)	37(23.4%)	46(29.1%)	3(1.9%)	158(100.0%)	0.000
Want to self-archiving published scholarly work	74(46.9%)	33(20.9%)	48(30.4%)	3(1.9%)	158(100.0%)	0.000

Source: Field Data (2020)

5.4.1 Factors influencing OAIRs usage

The study also uses the UTAUT model to examine the factors influencing OAIR usage. Therefore, motivating factors, technical supports, the influence of

colleagues/peers/supervisors, and the influence of ICTs infrastructure, gender, age, academic qualifications and, working experience were tested to find if they influence the OAIRs usage.

Table 6 shows the factors that influence OAIRs usage. Results indicate that motivating factors and the influence of colleagues/peers/supervisors ($P=0.001$) are the only variables that have a unique influence on the use of OAIRs.

This indicates that motivating factors and the influence of colleagues/peers/supervise influence on faculty members' behavioral intention on OAIRs usage and OAIRs usage. The implication is that faculty members who expect to improve their academic performances such as writing journal articles, book chapters, etc., will increase OAIRs usage, also faculty members who seek advice from colleagues, peer-authors, and supervisors on the OAIRs usage will increase the OAIRs u.

This is similar to the study done by Saulus (2018) and Amadin *et al.* (2018) who examined the influence of performance expectancy on the use of IRs, and found that performance expectancy and social influence have a positive influence on the use of OAIRs.

For effective use of OAIRs among faculty members, motivating factors and the influence of colleagues/peers/supervisors are very important. Therefore, the library management should make sure that the scholarly publications (especially the current ones) are available in the university OAIRs for faculty members to use in their academic activities.

Table 6: Factors influencing the use of OAIRs

Variables	95% Confidence Interval						
	Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Sex	.059	.285	.042	1	0.837	-.501	.618
Age	.556	.692	.645	1	0.422	-.801	1.912
Academic Qualification	-18.140	2368.750	.000	1	0.994	-4660.806	4624.525
Motivating factors	-16.766	2.849	34.626	1	.000**	-22.351	-11.182
Technical supports	18.574	2762.266	.000	1	0.995	-5395.367	5432.516
Influence of colleagues/peers/supervisors	12.837	1.435	80.010	1	0.000**	10.024	15.650
Availability of ICTS infrastructure	-.335	2.035	.027	1	0.869	-4.324	3.653

Note: ** significant at 1% level of significance

5.5 Challenges influencing the use of OAIRs among faculty members

Table 8 shows challenges influencing the use of OAIRs among faculty members. The respondents were asked to indicate challenges influencing the use of OAIRs. The results indicated that challenges influencing the use of OAIRs are; 50.5% low level of awareness, 36.9%, lack of ICTs infrastructure and personnel 19.8% lack of skills in using OAIRs, and 9.9% lack of effort and time. The implication is that there are different challenges that hinder the use of OAIRs. This result is similar to the study done by Rataya (2018) who revealed that faculty members are not using university OAIRs due to some challenges such as lack of awareness, power supply surges, fear of plagiarism, lack of policy, lack of time, copyright issues and slow internet. Therefore, library management needs to improve or eliminate these challenges. For instance, the provision of skills, awareness, and adequate ICTs facilities may only guarantee the use of university OAIRs among faculty members.

On the other hand, qualitative findings indicated challenges influencing the use of OAIRs among faculty members. One key informant explained:

“Most of the academic staff in their university do not use OAIRs because are not aware of the OAIRs”. (SUA, July, 2020)

Lack of skills in using OAIRs, low level of awareness, and lack of ICTs infrastructure and personnel were found to have no statistical significance difference ($p\text{-value} \geq 0.05$). While lack of effort and time was found to have a highly statistically significant difference at a 1% level of significance ($p\text{-value} \leq 0.05$). This show that there is quite a big variation in terms of reasons for not OAIRs, which could be a result of differences in use according to academic needs among the universities under study.

Table 8: Challenges influencing use of OAIRs among faculty members (n=158)

Challenges influencing the use of OAIRs among faculty members	Frequency (%)	p-value
Lack of skills in using OAIRs	22(19.8)	0.28
Low level of awareness	56(50.5)	0.00
Lack of ICTs infrastructure and personnel	41 (36.9)	0.00
Lack of effort and time	11(9.9)	0.69

Source: Field Data (2020)

5.6 Strategies to improve the use of OAIRs among faculty members

On the other hand, qualitative findings indicated strategies to improve the use of OAIRs among faculty members as suggested by key informants who explained:

“For the faculty members to use university OAIRs, the university or library management should conduct seminars, training, orientation to create awareness and skills of using OAIRs to faculty members.” (MU Sept, 2020)

“For the faculty members to use OAIRs the university and library management should ensure the availability of ICTs facilities like Internet connectivity.” (MU Se t,2020)

For the faculty members to use OAIRs the library management should make sure they upload more scholarly publications on area of specialization.” (MUHAS Marc ,2020)

“For the faculty members to use OAIRs the university and library management should increase advocacy programs to market the availability of scholarly publications in OAIRs”. (UDSM, Jan 2020)

“For the faculty members to use OAIRs the library management should make sure the university OAIRs are user-friendly”. (MU Sept 2020)

“For the faculty members to use OAIRs the library management should provide full text rather than abstracts.” (UDSM Jan, 2020)

The implication is that there are several challenges that hinder the use of university OAIRs. This is similar to the studies done by Abdelrahman (2017) and Oguche (2018) who affirmed that, in order to enhance the use of university OAIRs, there is a need for more awareness and advocacy programs to be carried out by the library to the academic community of the university. This is because many libraries in Tanzania still operate OAIRs in the traditional service where the major use of OAIRs are not taken seriously. Therefore, the university and the library management should improve those reasons to improve the use of university OAIRs. For instance, depositing up-to-date scholarly publications, providing full text, and increasing advocacy programs may only guarantee the use of scholarly publications archived in OAIRs among faculty members.

6.0 SUGGESTION FOR FUTURE RESEARCH

There should be research in the future to understand thoroughly the use of OAIRs among faculty members by adding more factors in the UTAUT model to improve the use of OAIRs.

7.0 CONCLUSION

The study investigated the usage patterns of Open Access Institutional Repositories (OAIRs) among faculty members in Tanzania universities. The overall key findings revealed that respondents indicate OAIRs are used to collect, preserve and disseminate scholarly

publications, to provide information to use for teaching, learning, and research work, to enhance resources sharing, to enhance collaboration among researchers, to increase institution visibility, to make research output more visible, and to self-archive scholarly publications. The study found that faculty members use OAIRs very often. Moreover, the factors that motivate community members to use OAIRs faculty members are motivated to use OAIRs are a desire to enjoy access to articles without hindrance and charges, OAIRs provide open access to the wider audience of researchers, a desire to increase the impact of research work, accessibility and downloading of research work, want to self-archiving published scholarly work, desire to increased citation to published scholarly work among others and want reward and promotion. The study further discovered that the main challenges influencing the use of OAIRs are lack of skills in using OAIRs, low level of awareness, lack of ICTs infrastructure and personnel, and lack of effort and time. In this case, the study concludes that there is still much to be done in Tanzanian universities to improve the extent of OAIRs usage among faculty members. Furthermore, the study recommends that the university, faculties, and libraries management who are saddled with the responsibility of OAIR should provide skills in using OAIRs, create more awareness on the use of OAIRs, provide stable ICTs facilities such as enough computers, Internet, and encourage faculty members to take time and effort to use OAIRs.

8.0 RECOMMENDATIONS

Based on the findings, the following recommendations have been made for improving the use of university OAIRs:

- The university, faculties, and library management should create more awareness of the use of OAIRs through advocacy, training seminars, and orientations to encourage the use OAIRs.
- The university, faculties, and library management should provide stable ICTs facilities such as enough computers and Internet to enhance OAIRs usage.
- The university, faculties, and library management should provide enough skills on the use of OAIRs to the faculty members to increase the extent of OAIRs use.
- The university, faculties, and library management should increase motive factors for university community members to use OAIRs.
- The university, faculties, and library management should find means to eliminate challenges influencing the usage of OAIRs in selected universities.

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6.0 CHAPTER SIX: GENERAL DISCUSSION

The chapter provides a general discussion, conclusion, and recommendations based on the specific objectives of the study.

6.1 General Discussion

This study investigated how OAIRs in Tanzania enhance access to local content to meet the varied information needs of potential users. Specifically, the study established the extent to which users engage in self-archiving of local contents in OAIRs in selected universities. It also, determined factors that influence archiving (deposition) of local contents in OAIRs among university communities, investigated the use pattern of contents uploaded into developed OAIRs by academic staff members and research fellows, and investigated how OAIR policies can be used to improve the collection of OAIR contents.

6.1.1 The extent to which users engage in self-archiving of local content in OAIRs in selected Universities

Findings on the extent to which users engage in self - archiving of local contents in OAIRs in selected universities were discussed in Chapter Two. The findings indicated that academic staff members were aware of the OAIRs but their engagement in depositing or self-archiving their locally produced contents in university OAIRs was low. Moreover, academic staff members encountered some challenges that hindered the self-archiving of content in OAIRs. Most of these challenges were technical in nature, such as slow internet connectivity. Others were categorized as philosophical and personal values such as lack of awareness, failure to follow the procedures, inadequate competencies, and issues concerning copyright. These

findings imply that academic staff members are not engaged much in depositing their scholarly publications in OAIRs because they are least aware of the process fail to follow procedures and lack requisite competencies. As a result, there are low number of contents in OAIRs leading poor visibility and accessibility of university's scholarly publications. Self-archiving of locally produced content in OAIRs is essential as it provides knowledge to the university community, satisfies local information needs, enhances free community access to content, and increases the visibility of both the staff and the university. Thus, low engagement in the self-archiving of locally produced content leads to a lack of content, low accessibility, and low visibility.

6.1.2 Factors that influence self-archiving (deposition) of local content in OAIRs among university communities

Findings on the factors that influence self-archiving (deposition) of local content in OAIRs among university communities were discussed in Chapter Three. The findings revealed that there are motivating factors that influence self-archiving of scholarly publications in OAIRs. Other factors found were technical supports, social influences, supporting services, and OAIR policy. However, the study found out that there are demotivating factors that hinders self-archiving of scholarly publications in OAIRs such as low level of awareness, inadequate advocacy, lack of rewards, fear for plagiarism issues, lack of enough ICT infrastructures, lack of time and effort required for academic staff members to self-archive. This implies that availability of motivating factors encourages academic staff members to self-archive their scholarly publications in OAIRs; therefore, there is a need to eliminate factors that hinder self-archiving process to increase numbers of self-archived contents in OAIRs.

6.1.3 The influence of existing OAIRs policy in improving the collection of OAIRs contents in selected universities in Tanzania

Findings on the Influence of Open Access Institutional Repository Submission Policy in the collection of OAIR contents were discussed in Chapter Five. Key findings revealed that the OAIR submission policy is available in their universities, as reported by 46.2 per cent of the respondents. The findings also revealed that OAIR submission policy has been used to direct academic staff to submit their scholarly publications in OAIRs (45.5%). Furthermore, in order to improve the collection of OAIR contents, regular awareness creation of the rules and regulations on how to submit in OAIRs was cited 24.5 per cent of the respondents as important strategy of increasing the use of OAIRs cited. About 18.5 per cent of the respondents suggested effective implementation of OAIR submission policy for academic staff members to submit in the university OAIRs as another strategy. About 16.3 per cent suggested for an increase visibility and accessibility of OAIR policy through the university website; and about 14 per cent suggested that OAIRs submission policy be made clear to authors and the institutions operating the OAIRs. This implies that OAIRs policy is not implemented in submission; as a result, there are few submissions and self-archiving in the OAIRs. Therefore, creating awareness of OAIR policy and putting more emphasis on the submission of content will enhance the content collection in OAIRs.

6.1.4 Usage patterns of OAIRs by academic staff and research fellows

Findings on the usage patterns of OAIRs by academic staff and research fellows were discussed in Chapter Four. The findings have revealed that most of staff members reported

using OAIRs for accessing scholarly publications for teaching, learning, and research work, downloading information for teaching, learning, and research work and few used OAIRs for self-archiving/depositing their scholarly works in OAIRs. The study has also revealed that motivating and social factors also influence the usage patterns of OAIRs (Unique influence at the 1% level of significance $p=0.000$). Furthermore, the study found out that creating awareness of the use of OAIRs, providing enough infrastructures, providing technical support, increasing social influence, and providing technical support would improve the use of OAIRs. This implies that academic staff use OAIRs to access different scholarly publications, but they are not adequately self-archiving their scholarly publications in OAIRs.

7.0 CHAPTER SEVEN: GENERAL CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The study concluded that it is essential to engage academic staff members in using OAIRs in self-archiving of locally produced content in the university OAIRs, which will increase the contents in OAIRs and enhance visibility and access of locally produced contents. In addition, OAIR policies should be implemented in submission to increase the contents in OAIRs. Without implementing the policy, OAIRs may remain virtually empty.

7.2 Recommendations

Based on foregoing conclusions, the following recommendations are made:

- For improved engagement in self -archiving of local contents in OAIRs among academic staff members, the study recommends that universities and other academic organizations should engage academic staff members in self-archiving their academic works. This can be done by creating more awareness on self-archiving, providing incentives to academic staff that self-archive their scholarly publications in OAIRs, providing regular training, and education to academic staff on how to upload contents in OAIRs and providing good internet connectivity to encourage academic staff members to use OAIRs.
- To strengthen the self-archiving of scholarly publications for improved access to local content in Tanzania, the study recommends that the university management should provide ICT infrastructure, technical support such as ICT technicians. Others include creating awareness by conducting workshops

and training, providing rewards and promotions to academic staff members who self-archive their publications, educating academic staff members on issues concerning plagiarism and giving them more time to self-archive and put more emphasis on the implementation of OAIR policies.

- For the use of OAIRs policy to improve the collection of OAIR contents, the study recommends that institutions should formulate OAIR policies to direct academic staff members to submit or self-archive their scholarly publications in OAIRs. OAIR policies should mandate academic staff members to submit their scholarly publication in the university OAIRs for the sustainability of OAIRs. Universities should also invest in advocacy and marketing strategies on the importance of OAIR policies to improve the growth of OAIR content.
- For improved use of OAIRs, the study recommends that University Library Management should emphasize the use of OAIRs, especially on self-archiving of scholarly publications in OAIRs. This can be done by conducting workshops, and training and creating more awareness, imparting knowledge and skills on the use of OAIRs. In addition, factors that influence the use of OAIRs such as performance expectancy, colleagues, peer-authors, and supervisors should be emphasized to encourage fellow academic staff members to use OAIRs for their academic purposes.

7.3 Contribution of this Study to the Body of Knowledge

The study findings will contribute to the existing body of knowledge, especially in OAIRs usage (i.e., depositing of

scholarly publications), which could enhance access to local content for academic communities.

Thus, the study also has practical implications on the promotion of the use of OAIRs for academic staff to deposit their scholarly publications to enhance access to local content. Likewise, the study also has some significant theoretical contributions. The study contributed to the policy where it emphasized the implementation of OAIRs in submission to increase the number of contents in OAIRs. The UTAUT model guided the study in determining factors that influence individual behaviour on the use of OAIRs.

7.4 Suggested Area for Further Research

This study investigated how OAIRs in Tanzania enhance access to local content to meet the varied information needs of potential users. Specifically, the study looked at the extent to which users engage in archiving (deposition) of local contents in OAIRs, the usage patterns of OAIRs among academic staff members, and how OAIR policy can be used for enhancing the collection of OAIR contents in four selected public universities in Tanzania as presented in the methodology. . However, there are other institutions with OAIRs in Tanzania. Therefore, other studies could cover other private and public institutions to explore; additional incentives that may be offered to academic staff members to intensify their efforts and attitudes toward self-archiving in established OAIRs. Other models that will guide in determining other factors that influence self-archiving in OAIRs in developing countries could also be explored. The usage patterns of OAIRs among academic staff members or researchers in other public and private institutions to determine whether there are similarities or differences in the usage patterns of OIRs. Other factors that influence

submission/self-archiving of scholarly, produced content in OAIRs rather than OAIRs policy could be explored.

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APPENDICES

Appendix 1: Sampling Frame

This study sample size was estimated using Slovin's formula ($n = N / (1 + Ne^2)$). Where "n" is the sample size, "N" is the total population (2894) and "e" is the margin of error (0.05). Therefore, $2894 / (1 + 2894 * 0.05 * 0.05) = 2894 / 2895 * 0.0025 = 2894 / 7 = 413$ (see the sampling frame Table 1).

Table 1.1: Sampling frame

University	Academic staff population (N)	<i>The proportion from the required 'n'</i> <i>(N/2894) * 413</i>
MUHAS	693	99
MU (Main campus)	236	34
SUA (Only Main campus and SMC)	427	61
UDSM (Main campus)	1538	219
Total	2894	413

Source: Field Data (2020)

Appendix 2: Analytical Framework

No	Specific Objectives	Research Questions	Mode of analysis	Test statistic
1	To establish the extent to which users engage in self-archiving of local. Contents in OAIRs in selected universities.	To what extent do academic staff and research staff engage in self-archiving of local contents in OAIRs in selected universities?	Descriptive statistics	Chi-square
2	To determine factors that influence archiving of local contents in OAIRs among university communities.	What are the factors that influence archiving of local contents in OAIRs?	Binary regression analysis	Logit

3	To investigate the use pattern of local contents uploaded into developed OAIRs by academic staff and research fellows.	What are the use patterns of local contents uploaded in developed OAIRs by academic staff and research fellows?	Descriptive statistics	Chi-square
4	To investigate the influence of existing OAIRs policies in development of OAIRs collection in selected universities in Tanzania	What is the influence of existing OAIRs policies in development of OAIRs collection in selected universities in Tanzania?	Descriptive statistics	Chi-square

Appendix 3: The Binary Logistic Regression Model

Determinants of researchers' OAIRs usage behaviour

$$L_i = \left(\ln \frac{P_i}{1 - P_i} \right) = Z_i = \beta_0 + \beta_1 X_i + \dots + \beta_n X_n$$

Where: L_i is the log of the odds ratio, linear not only in the explanatory variables but also in the parameters. Ln is the logit, and hence it is the logit probability model. Z_i (Dependent variable) stands for usage of OAIRs with a value of 1 for the researchers who are willing and using OAIRs and 0 for the researchers who are not willing and not using OAIRs. X_i (Independent variables) refers to researcher's characteristics and institutional factors.

A. Variables

1. **Dependent variable** z_i = Usage of OAIRs

2. **Independent variables**

x_1 = Performance Expectancy

x_2 = Facilitating condition

x_3 = Social influence

x_4 = Effort expectancy

3. **Predictors**

x_5 = Sex

x_6 = Age

x_7 = Experience

x_8 = Computer literacy

B. Instruments

P- Value of 0.05 measure significance level

P-value $\leq \alpha$: The association is statistically significant

If the p-value is less than or equal to the significance level, you can conclude that there is a statistically significant association between the response variable and the term.

P-value $> \alpha$: The association is not statistically significant

If the p-value is greater than the significance level, you cannot conclude that there is a statistically significant

association between the response variable and the term. You may want to refit the model without the term.

Odds ratio is used to significance level to understand the effect of a predictor.

Odds ratios that are greater than 1 indicate that the event is more likely to occur as the predictor increases. Odds ratios that are less than 1 indicate that the event is less likely to occur as the predictor increases.

To determine how well the model fits your data, examine the statistics in the model Summary table. For binary logistic regression, the data format affects the deviance R^2 statistics. The higher the deviance R^2 , the better the model fits your data. Deviance R^2 is always between 0% and 100%. Deviance R^2 always increases when you add additional predictors to a model.

Deviance R^2 is just one measure of how well the model fits the data.

To determine whether the model does not fit the data the goodness-of-fit is used.

The goodness-of-fit tests is indicated below.

Goodness-of-Fit Tests

Test	DF	Chi-Square	P-Value
Deviance	68	80.16	0.1486
Pearson	68	71.96	0.3483
Hosmer-Lemeshow	8	9.71	0.2859

Appendix 4: Schedule of Activities

Activity	Timing			
	Year I	Year II	Year III	Year IV
Registration, concept note preparation and presentation	■			
Research proposal and instruments development, proposal presentation and amendment		■		
Phase 1 of data collection – Selection of study universities, questionnaire pre-testing and final questionnaire development		■		
Phase 2 of data collection –FGDs and KI interviews		■		
Phase 3 of data collection – Administering structured interviews			■	
Data analysis and interpretation			■	
Thesis writing and submission				■

Appendix 5: Questionnaire guide

SECTION 1: Demographic information

This section is designed to gather demographic information. (Your answers are confidential).

Please complete the following demographic information

1. Sex ☐ Male ☐ Female

2. Age.....

3. What is your highest academic qualification? (Please tick on appropriate box)

☐ PhD

☐ Master Degree

☐ Bachelor's Degree

☐ Other (please specify)

5. Which of the following is your current academic position? (Please tick on appropriate box)

☐ Tutorial assistant

☐ Assistance lecturer

☐ Lecture

☐ Senior lecturer

☐ Professor

☐ Senior professor

Other (please specify)

6. Which of the following is your work experience? (Please tick on appropriate box)

☐ 0-10

☐ 10- 20 ☐ 30- 40

☐ 50- 60

☐ 60 and above

7. SECTION 2: (a) Awareness of OAIRs

This section is designed to gather information on general awareness on OAIR. (Please tick all that apply)

☐ I am aware of the existence of my university OAIR

☐ I am aware of the benefits of OAIR

☐ I am aware of the content of my university OAIR

☐ I am aware of my university OAIR policy

☐ I am aware of the publishers' policy on OAIR

☐ I am aware of the processes of depositing (self- archiving) my work into OAIR

8. How did you first get to know about Open Access Institutional Repositories? (Please tick all that apply)

☐ Through Internet

☐ Through journals

☐ From colleagues /friends

☐ From faculty

Others

9 (b) *Level of awareness of university communities about OAIRs*

What is the level of awareness on university OAIRs? (please tick were appropriate)

☐ Extremely aware

☐ Moderately aware

☐ Somewhat aware

☐ Slightly aware

☐ Not at all aware

SECTION 3: Self – archiving of local contents in OAIRs

This section is designed to gather information on self – archiving of local contents in OAIRs.

10. Do you know the processes of depositing your work into university OAIR?

☐ Yes

☐ No

☐ Do not know

11. Have you (self- archived) deposited any work on university OAIR? (Please tick on appropriate box)

☐ Yes

☐ No

☐ Do not know

12. Who assisted you in (self- archiving) depositing your work in the university OAIRs? (Please tick all that apply)

☐ Self (Self-archiving) ☐ Department staff

☐ Colleagues

☐ Library / ICT Technician

☐ Library staff

Other (specify please)

13. If yes, what are the types of work that you have (self- archived) deposited into the university OAIRs? (Please tick all that apply)

☐ Journal article

☐ Research reports/technical reports

- ☐ Book chapters
 ☐ Dissertation/thesis
☐ Conference presentations
 ☐ Course syllabi
☐ Lecture notes, handouts, and assignments

Other (specify please)

14. When was the last time that you (self- archiving) deposit your work into the university OAIRs? (Please tick on appropriate box)

- ☐ 1-6 months ago
 ☐ 7-12 months ago
☐ 1-2 years ago
 ☐ More than 3 years ago

Other (specify please)

15. How do you rate the importance of (self- archiving) depositing scholarly work and teaching materials into your OAIRs? (Select the one that applies to you)

- ☐ Important
 ☐ Not important

16. What motivated you to (self- archiving) depositing scholarly work and teaching materials at your OAIRs as a researcher? (Please tick all that apply)

- ☐ Communicate with colleagues
 ☐ Professional advancement
☐ Professional recognition
☐ Influence of co-authors
 ☐ Influence of supervisor
☐ Culture

Other specify.....

17. From q11. if no, what are the reasons that cause you not to (self- archive) deposit into the university OAIRs? (Please tick all that apply)

- ☐ Copyright issues
 ☐ Fears for plagiarism
☐ Lack of personal benefit
 ☐ My work is confidential

Other specify.....

18. From q11, if no, have you ever thought of (self- archiving) depositing your work to the university OAIRs in the near future?

- ☐ Yes
 ☐ No

(Please provide any reason behind your decision)

SECTION 4: Use patterns of local contents developed in OAIRs

This section is designed to gather information on use patterns of local contents developed in OAIRs

19 Do you use local contents developed in your university OAIR?

☐ Yes ☐ No ☐ Not aware

20 (a) If yes what type of content do you use most frequently?
(Please mention some of them)

.....

b) To what kind of use do you put the local contents accessed from the OAIRs developed from your university.....

21. Are the contents available in university OAIR sufficient?

☐ Yes ☐ No ☐ do not know

22. If no what kind of content missing or you will like to be added in your university OAIR? (Please mention few of them)

.....

.....

2	From question 19. If yes how often? Tick one box against each statement - Key (1) strongly disagree, (2) Disagree (3) Neutral (4) Agree (5) strongly agree.					
3						
	How often do you use local contents developed in OAIRs?					
		1	2	3	4	5
	Always					
	Frequently					
	Occasionally					
	Rarely					
	Never					

24.If no, which other university OAIR local contents developed do you use?

(Please provide name of the OAIRs)

25. What are the reasons that cause you not to use local contents developed in your university OAIRs? (Please tick all that apply)

- ☐ No enough local subject contents
- ☐ No up dated local subject contents
- ☐ Unavailability of network
- ☐ Not interested

Other specify.....

26 SECTION 5: Factors that influence archiving (deposition) of local contents in OAIRs among university communities.

2 6	SECTION 5: Factors that influence archiving (deposition) of local contents in OAIRs among university communities. This section is designed to gather information on the factors that influence archiving (deposition) of local contents in OAIRs among university communities.					
	Tick one box against each statement - Key (1) strongly disagree, (2) Disagree (3) Neutral (4) Agree (5) strongly agree.					
	PERFORMANCE EXPECTANCY	1	2	3	4	5
	I would find content deposition in OAIRs useful in my job					
	OAIRs enable me to publish my teaching and scholarly work more quickly					
	Content deposition in OAIRs increases my teaching and scholarly productivity					
	EFFORT EXPECTANCY					

	I expect interaction with OAIRs to be clear and understandable					
	I would find the system easy to use					
	It is easy to deposit works published in OAIRs					
	SOCIAL INFLUENCE					
	People who influence my behavior think that I should deposit content in OAIRs					
	My colleagues think that I should use and deposit content in OAIRs					
	My institution requires me to use and deposit content in OAIRs.					
	The administration of this university has been supportive in depositing content in OAIRs					
	In my field, it is common for researchers to post their research outputs on OAIRs					
	It is common for faculty and students to share research outputs in my department					
	In my department, it is common for faculty to publish in OAIRs					
	FACILITATING CONDITION					

	I have the knowledge necessary to deposit content in OAIRs.					
	I have the resources necessary to deposit content in OAIRs					
	I have the necessary resources (e.g. Internet access) deposit content in OAIRs					
	I have the resources (e.g. Internet access) necessary to deposit content in OAIRs					
	Guidance is available for me to use the Internet for depositing content in OAIRs					
	A specific person (or group) is available to give me guidance to deposit content in OAIRs					

SECTION 6: Influence of existing OAIRs policies in the development of OAIRs collection.

This section is designed to gather information on influence of existing OAIRs policies in the development of OAIRs collection.

27 Have you ever heard about OAIRs policy?

☐ Yes

☐ No

28 Does your university have OAIR policy?

☐ Yes

☐ No

☐ Don't know

29. Have you ever read your university OAIRs policy?

☐ Yes

☐ No

30. Does OAIRs policy encourage you to deposit your scholar works?

☐ Yes ☐ No

If yes (Please mention how)

31. Does your university OAIRs policy contribute in the growth of OAIRs content?

☐ Yes ☐ No

(Please mention)

32. Mention other issues which can be included in OAIR policies for improving the growth of OAIRs content. (Please mention)

SECTION 7: Overall satisfaction of existing OAIRs in the institution.

This section is designed to gather information on level of satisfaction of existing OAIRs in the institution

33. Which level of satisfaction do you consider yourself of the existing university OAIRs?

☐ Very high ☐ High ☐ Neutral
☐ Low ☐ Very low

May I thank you for spending your valuable time in answering this questionnaire