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

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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 Oadini (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 Omosekejimi, 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 OAIRs 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 Odiini, 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 Odiini (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

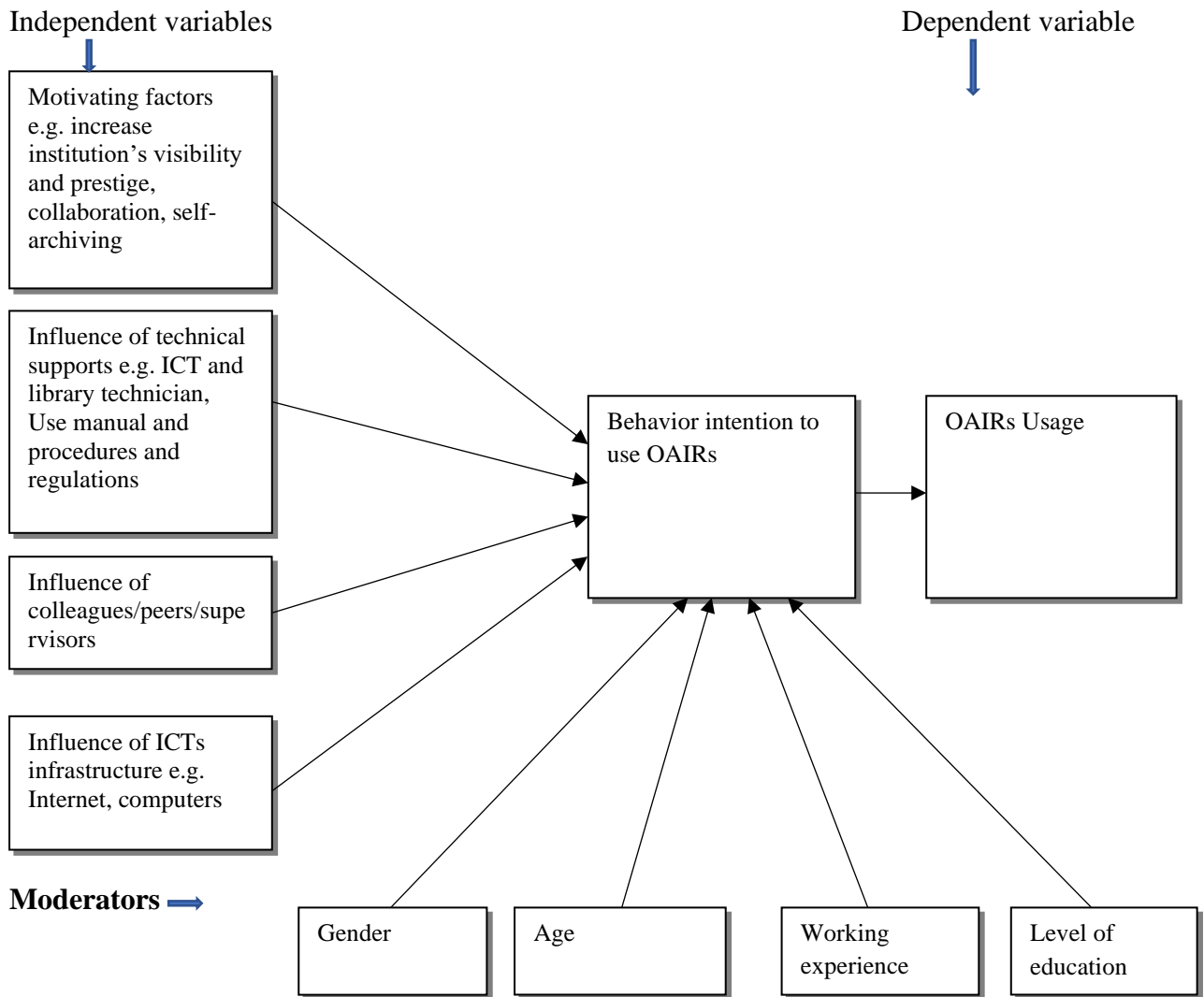


Figure 1: Conceptual Framework for the study

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.

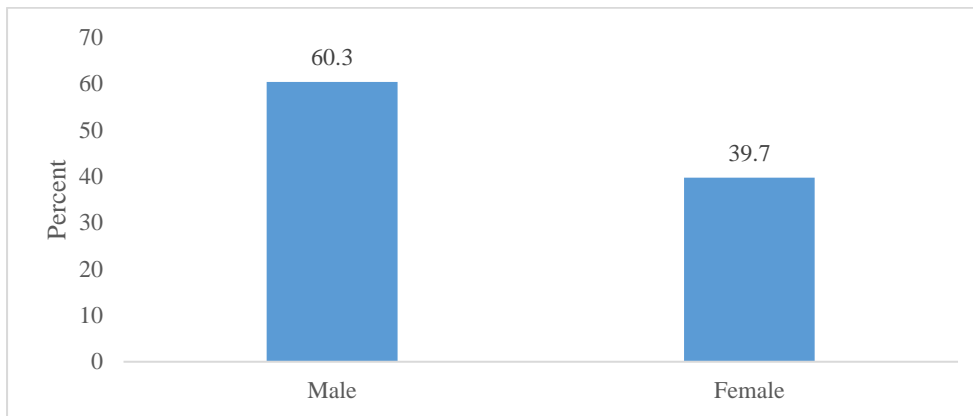


Figure 2: Distribution of respondents by Sex (n=292)

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.

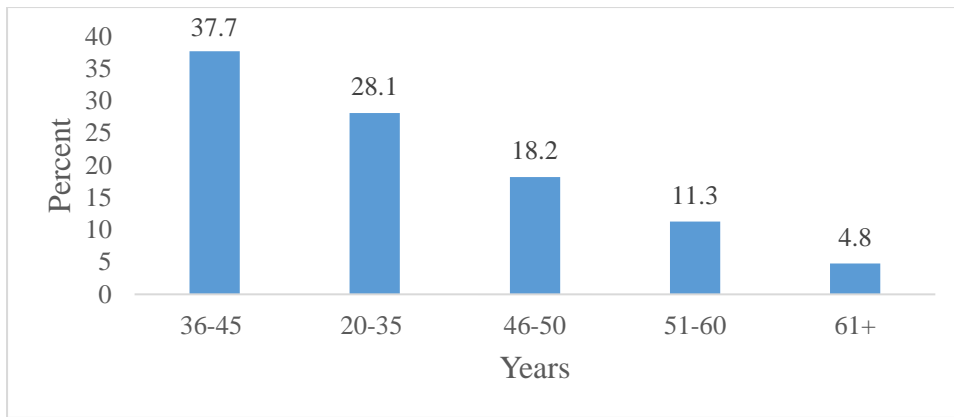


Figure 3: Distribution of respondents by age (n=292)

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.

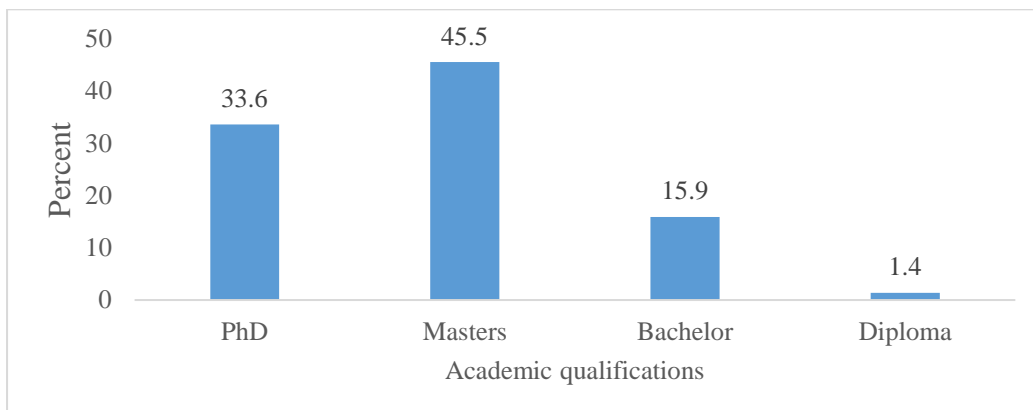


Figure 4: Distribution of respondents by academic qualifications (n=292)

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.

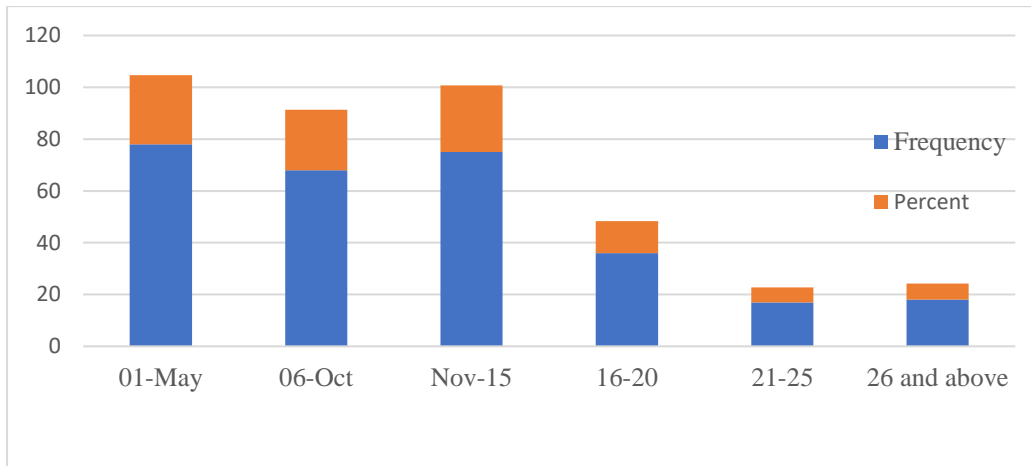


Figure 5: Distribution of respondents by working experience (n=292)

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-value ≤ 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 increases 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				Not applicable	Total	p-value
	Yes	Neutral	No			
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 Sichalwe (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-value ≤ 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		Total	p-value		
	Sufficient	Moderate				
	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 Fasaie *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					N/A	p-value
	Always	Often	Sometime	Rarely	Never		
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	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						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-value ≥ 0.05). While lack of effort and time was found to have a highly statistically significant difference at a 1% level of significance (p-value ≤ 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 Oguiche (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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