Effective Approaches for Improving the Uptake of Institutional Repositories Content in the Higher Education Institutions in Zambia

by

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LUSAKA

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Copyright Declaration

Declaration

I, Matildah Mercy Muchinga, do hereby declare that this dissertation is my own work. Any published or unpublished work or materials of other persons used have been acknowledged and that this work has not previously been submitted at this or any other University for similar or any other purposes.

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Certificate of Approval

This dissertation by Matildah Mercy Muchinga is approved as fulfilling the requirements for the award of the Degree of Master of Library and Information Science (MLIS) by the University of Zambia.

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Abstract

Higher Education Institutions (HEIs) are essential for academic research in Zambia. Despite the active research conducted by students and academic staff within these HEIs, the resulting output faces challenges in terms of visibility and uptake. Therefore, this study aimed to identify effective approaches for improving the uptake of IR content in HEIs in Zambia, and the specific objectives were; to determine the uptake of scholarly resource output in IRs, to identify effective techniques for depositing legacy content and to determine techniques that will ensure the effective use of self-archiving approaches.There are 11 HEIs in Zambia (six public and five private) with functional Institutional Repositories (IRs) that conduct a lot of research; however, a substantial disparity exists between the content in these IRs and academic staff's Google Scholar profiles. Additionally, the annual trend and uptake in the IRs are very low as compared to the publications indexed on Google Scholar profiles of the academic staff of these HEIs. The expectation is that when you deploy the IR, it will result in a gradual increase in uptake because more and more people are going to be using it. The study identified academic staff with Google Scholar profiles from the HEIs, and the Publish or Perish software was employed to extract author publications from these profiles alongside Octoparse in cases where OAI-PMH was not activated. The study further employed a descriptive survey research design to collect and analyse the data for objectives two and three by conducting interviews. The study found a significant disparity between the content available in IRs and on Google Scholar profiles across HEIs, with 90% of available publications on Google Scholar profiles missing on the IRs. The study also revealed that IR uptake rates are generally low, with fluctuating trends over the years. At UNZA, the average IR uptake rate is very low: 11%, ZCAS is 37%, UNILUS is 0.8%, CU is 6%, ICU is 20%, CHAU is 7%, MU is 4%, and LAMU is 28%, respectively. The research revealed that academic staff were not aware of the IRs and their responsibility to submit publications. However, upon becoming aware, they expressed their willingness to submit the missing publications to the librarians through emails, submitting their Google Scholar profile IDs. The findings suggest that providing academic staff members with training and support about the IRs and their benefits, implementing clear IR deposit policies, and automating the deposit process would be effective strategies for ensuring that missing content or publications are uploaded to the IR. The study recommends that IRs should focus on training and supporting academic staff members, implementing clear policies, automating the deposit process, and collaborating with departments and research units to streamline the self-archiving process and improve the uptake of IR content. The research also recommends that HEIs should establish clear guidelines, responsibilities, communication channels, and support mechanisms to foster collaboration, compliance, and contributions from academic staff, departments, librarians, and other stakeholders. The study concludes that by implementing these recommendations, HEIs can improve the uptake of IRs, increase the visibility and uptake of scholarly research output, and enhance the reputation and success of academic work in HEIs.

Key Words

Institutional Repositories, Higher Education Institutions in Zambia, Institutional Repository Uptake, Legacy Content, Self Archiving Approaches

Dedication

This work is dedicated to my beloved husband, Mr. Misheck Nchimunya Kagele, my daughter, Mwaanga Luyando Kagele, my mother, Ms. Anna Elizabeth Chiyaba, and my niece, Ms. Rose Muchinga, for their unwavering support and encouragement throughout my academic journey. I also express gratitude to my dear sisters, brothers, relatives, and friends who patiently endured my constant busyness. A special tribute is extended to my mentors, Mr. Boster Chiyaba, Dr. Grivas Chiyaba, and Mrs. Mirriam Musindi Akayombokwa Chiyaba, whose belief in me and continuous financial and emotional assistance played a pivotal role in my successful pursuit of an undergraduate degree in Library and Information Science at the University of Zambia.

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List of Abbreviations and Acronyms

CBU	Copperbelt University
CHAU	Chalimbana University
CU	Cavendish University
DOI	Diffusion of Innovation
ETDs	Electronic Theses and Dissertations
HEA	Higher Education Authority
HEI	Higher Education Institutions
ICTs	Information Communication Technologies
ICU	Information and Communication University
IRs	Institutional Repositories
KNU	Kwame Nkrumah University
LAMU	Lusaka Apex Medical University
MU	Mulungushi University
NDLTD	Networked Digital Library of Theses and Dissertation
OA	Open Access
ORchiD	Open Educational Materials Depositor
SAT	Self-Archiving Tool
TAU	Texila American University
UNILUS	University of Lusaka
UNISWA	University of Eswatini
UNZA	University of Zambia

CHAPTER 1

INTRODUCTION

1.1 Overview

This chapter introduces the context of the study by discussing the background, the statement of the problem, the objectives of the study and research questions, the significance and limitations of the study, the theoretical framework, and the operational definitions of concepts.

1.2 Background of the Study

In the context of Higher Education Institutions (HEIs) in Zambia, the library serves as a vital cornerstone for academic activities, acting as a central hub for teaching, curriculum development, learning support, and research endeavors. Within this environment, students, lecturers, and researchers have access to a wealth of information resources that are essential for their academic pursuits and scholarly endeavors.

Jones (2005) defines digitization as the process of converting analog materials into a digital format suitable for use in various computer applications. This technological advancement has revolutionized the way information is preserved, accessed, and shared. Digitization technology offers record institutions, including libraries, the opportunity to create and disseminate multimedia documents, enabling them to reach a global audience with their valuable resource information.The effort to digitise the intellectual property of the institution is what is known as digitization (Eke, 2011).

Abu and Fabunmi, (2009) argue that digitization improves access to library resources. By digitizing library collections, information will be accessible to all instead of a group of researchers, and digital projects will allow users to search for collections rapidly and comprehensively from anywhere at any time. Digitization makes the invisible visible. Several users can access the same material at the same time without hindrance, and it removes the problem of distance, as users do not have to travel to libraries that possess hard copies of library materials before they can access and use such materials (Cullen and Chawner, 2008).

According to Barton (2004), an IR is a database with a set of services to capture, store, index, preserve, and redistribute a university's scholarly research in digital formats. A mature and fully realized IR will contain the intellectual works of faculty and students, which include research,

teaching materials, and documentation of the activities of the institution itself in the form of records of events and performances and of the ongoing intellectual life of the institution (Lynch, 2003). It is a new channel for structuring the university's contribution to the broader world (Lynch, 2003).

1.2.1 Importance of Implementing Institutional Repositories HEIs

The implementation of institutional repositories in higher education institutions holds significant importance for various reasons:

i. Enhanced Visibility and Prestige: IRs provide a centralized platform for universities to showcase the academic work of their staff and students. By consolidating scholarly publications, research outputs, and educational resources in one place, institutions can increase their visibility and prestige within the academic community (Crow, 2002).
ii. Global Access and Impact: Through IRs, universities can make their research outputs freely accessible to a global audience via the internet. This open access approach enhances the dissemination and impact of academic work, increasing the reach and influence of the institution's scholarly contributions.
iii. Simplified Research Reporting: Depositing academic works into IRs can streamline the administrative burden of reporting publications for research assessment and review exercises. This simplification benefits both the institution and academic authors by providing a central archive of works and facilitating the documentation of scholarly activities.
iv. Preservation of Intellectual Output: IRs play a crucial role in preserving the intellectual output of universities in digital form. By storing and managing digital content over time, IRs ensure the long-term accessibility and preservation of scholarly materials, research data, teaching resources, and other institutional intellectual assets.
v. Support for Open Access Initiatives: IRs align with the principles of open access by providing free online access to research articles and scholarly materials. This commitment to open access facilitates broader access to academic resources, promotes knowledge sharing, and contributes to the advancement of scholarship and research.

These IRs serve as valuable platforms for showcasing and disseminating the academic achievements and contributions of universities, ultimately benefiting the institution, its academic community, and the broader scholarly community (Hockx-Yu, 2015).

In Zambia, IR is implemented by HEIs as a way of storing and making available scholarly research outputs. These HEIs play a vital role in providing training towards the attainment of certificates, diplomas, and undergraduate and advanced degrees such as Masters and Doctoral degrees, and they conduct research that is aimed at solving many of society's pressing problems (Phiri, 2018).

1.3 Statement of the Problem

Zambia has seen a steady increase in the number of HEIs; there are a total of 64 registered higher educational institutions (HEIs), of which 13 are public HEIs and 51 are private HEIs, (HEA, 2023). While there has been an increase in the number of registered HEIs and corresponding enrolment rates of postgraduate students, the online visibility of scholarly research output is still noticeably low in Zambia (Phiri, 2018).

A common challenge encountered in HEIs is the significant gap between the research conducted by students and academic staff and the representation of this work in IRs. Despite a considerable amount of research being undertaken, there is a noticeable disparity between the content available in the IRs of HEIs in Zambia and the information showcased on the Google Scholar profiles of academic members of staff and researchers. This indicates a need for improved synchronization and comprehensive representation of academic output across various platforms to enhance the accessibility and visibility of scholarly work within the academic community.

The University of Zambia (UNZA), as one of the HEIs, has set up an IR (UNZA Repository Home), which, in part, is used for archiving faculty staff-authored pre-prints and post-prints and electronic theses and dissertations (ETDs) (Phiri, 2021). However, while the UNZA has had a functional repository for a considerable number of years and conducted a lot of research, the content deposited into the IR does not reflect its staff complement, the quantity of prior research published by staff does not reflect what content is available in the repository (Phiri, 2018).

In addition, the magnitude of the UNZA research output is not known, and the recency of content deposited in the UNZA IR is a major issue (Phiri, 2021). As a result, this has had a

negative effect not only on the university's international recognition but also on the country at large.

Another study on higher education quality and student satisfaction in Zambia found that the lack of context-specific research evidence entails that universities have inadequate information to develop strategies and set resource allocation priorities to improve quality (Bwalya, 2023)

These studies suggest that HEIs in Zambia face challenges in terms of research output and online visibility, and there is a need for more research to understand the extent of the problem and develop strategies to address it. It is in light of this gap that this study aimed to identify effective approaches for improving the uptake of IR content in HEIs in Zambia.

1.4 Research Objectives

1.4.1 General Objective

The main objective of this study was to identify effective approaches for improving the uptake of IR content in HEIs.

1.4.2 Specific Objectives

1. To determine the uptake of scholarly resource output in IRs
2. To identify effective techniques for depositing legacy content
3. To determine techniques that will ensure the effective use of self-archiving approaches.

1.5 Research Questions

In order to achieve the objectives stated above, attempts were made to find answers to the following questions:

1. What is the uptake of scholarly resource output in IRs?

This research question sought to find out the IR content status in HEIs and the subjective views of the key stakeholders associated with the uptake by finding out how content authored or co-authored by researchers is not made available on IRs.

2. What effective techniques can be employed for depositing legacy content in the IRs?

This research question involved finding mechanisms for archiving old content that has been done by researchers in the recent past but has not been archived in the IRs.

3. What techniques can be used to ensure effective self-archiving among the academic staff and researchers?

This research question was intended to find out effective techniques that can be used to improve self-archiving among academic staff and researchers.

1.6 Significance of the Study

It is anticipated that the findings of the study may contribute to the following: empirical evidence showing the low IR content in the HEIs in Zambia. It will equally identify the effective approaches and techniques that will ensure the effective use of self-archiving, thereby improving the uptake of IR content in the IRs of HEIs. In the same vein, once the uptake of IR content is increased, the online visibility of scholarly research output in the HEIs will increase, and the IRs will reflect their staff complement. It will furthermore have a positive effect on international recognition, not only as HEIs but as a country at large.

In addition, this study may not only generate empirical knowledge on the effective approaches for improving the uptake of IR content in HEIs, but it could also lay the foundation for further research.

1.7 Theoretical Framework

The Diffusion of Innovation (DOI) Theory, a social science theory created by Everett M. Rogers in 1962, was used in this investigation. The theory explains how new ideas, products, or behaviors spread through a specific population or social system over time[1].

The theory involves an innovation that is communicated through certain channels over time among the members of a social system. The result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. The theory focuses on several concepts, including innovation attributes, intervention clusters, demonstration projects, societal sectors, and more[2].

In this study, the theory could be applied to understand the factors influencing the adoption of depositing research output into IRs by academic staff and researchers, including the perceived benefits of the innovation, the communication channels through which awareness about IRs is spread, and the characteristics of the academic staff that influence their decision to adopt the practice.

In the context of improving the uptake of IR content in Zambian HEIs, applying the principles of the DOI theory involves understanding the characteristics of both the innovation (IR) and the adopters (academic staff and researchers). The following are effective approaches aligned with this theory:

1. Communicate the relative advantage**:** it's important to emphasize the advantages and benefits of using the IR by highlighting how it offers a platform for showcasing research, thereby increasing the visibility and citation impact of the academic members of staff and researchers. Additionally, showcase success stories and positive outcomes from early adopters to demonstrate the relative advantage.
2. Simplify and clarify: Ensure that the use of the IR is straightforward and user-friendly by integrating clear and simple instructions on how to submit, search, and access content. This will encourage more academic members of staff and researchers to engage with the

[1] https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/behavioralchangetheories4.html
[2] https://cris.maastrichtuniversity.nl/ws/portalfiles/portal/12579631/5833700.pdf

repository. And timely address any perceived complexity that might act as a barrier to adoption.

3. Engage early adopters: identify and involve influential individuals or departments as early adopters. These early adopters can serve as opinion leaders and role models, promoting the use of IR within their academic circles. Their positive experiences can inspire others to follow suit [3].

4. Facilitate trialability: Allow potential users to experiment with the IR on a smaller scale before committing fully. This might involve piloting the use of the repository within specific departments or for particular types of content. This approach enables users to experience the benefits firsthand.

5. Promote observability: Increase the visibility of the IR's impact by showcasing the utilization and success of the repository. This can be achieved by regularly updating stakeholders on the growth of content, highlighting featured research, and demonstrating the increased citation rates or collaborations resulting from IR engagement.

6. Address compatibility issues: Ensure that the IR aligns with the existing workflows, values, and goals of academic staff and researchers. Integration with existing systems and seamless interoperability can mitigate resistance to adopting the innovation.

7. Institutional support and policies: Establishing institutional policies that support and encourage the use of the IR by providing necessary resources, such as training sessions and technical support, reinforces the commitment of the institution to the successful diffusion of innovation.

By applying these approaches in alignment with the DOI theory, HEIs in Zambia can strategically enhance the uptake of IR content, fostering a culture of collaboration, visibility, and knowledge dissemination within the academic community.

[3] https://books.google.co.zm/books?id=9U1K5LjUOwEC&printsec=frontcover&redir_esc=y#v=onepage&q&f=false

1.8 Limitations of the Study

The study was focused on IRs in HEIs. Therefore, the information collected in the study was exclusive to the selected number of institutions that were part of the study, and the recommendations were only to be generalized to HEIs that share similar settings and conditions as those of the selected institutions. Some HEIs had only recently set up IRs, and the extraction of author details on Google Scholar only focuses on authors that have explicitly used the HEI in question as their affiliation. Authors with affiliations linked to places where they did their postgraduate studies are automatically excluded. The matching of publications uses titles and dates, potentially missing out on titles entered in a different format in IRs, e.g., a lack of use of subtitles. The text suggests that future research can expand the survey, the HEIs studied, and/or address the methodological limitations of this study.

1.9 Operational Definitions of Concepts

Higher Educational Institutions: These are institutions that offer tertiary education and provide preparation in fields such as law, theology, medicine, business, music, art and so on.

Institutional Repositories: An institutional repository is an archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution.

Metadata: A set of data that describes and gives information about other data.

Electronic Thesis and Dissertations: is an openly-accessible electronic version of thesis or dissertation that is kept in an online Institutional Repositories instead of a bound paper copy.
Metadata quality: Refers to seven general characteristics of metadata i.e.; completeness, accuracy, provenance, conformance to expectations, logical consistency and coherence, timeliness, and accessibility

OAI-PMH: Open Archives Initiatives Protocol for Metadata Harvesting

OA: open access

1.10 Summary

In summary, chapter one provides a comprehensive overview of the context, issues, objectives, and theoretical framework of the research project focused on improving the uptake of Institutional Repository (IR) content in Higher Education Institutions (HEIs) in Zambia. It begins by highlighting the critical role of libraries in HEIs and the evolving landscape of digitization and IRs. The significance of IRs in disseminating scholarly research output, particularly in Zambia, is underscored, alongside the challenges faced, such as low online visibility and disparities between research conducted and its representation in IRs. These challenges necessitate a deeper understanding and effective strategies to enhance IR utilization.

To address these issues, the research objectives were outlined, focusing on determining uptake levels, identifying techniques for depositing legacy content, and improving self-archiving among academic staff and researchers. Corresponding research questions were formulated to guide the investigation. The significance of the study lies in its potential contributions to empirical evidence, enhancement of IR utilization, and ultimately, the increase in online visibility of scholarly research output. Moreover, it sets the stage for further research in this area.

The chapter concludes with the theoretical framework of the Diffusion of Innovation (DOI) Theory, which provides a lens for understanding the adoption of IR practices. Effective approaches aligned with this theory are outlined, emphasizing communication, simplicity, early adoption, trialability, observability, compatibility, and institutional support.

Finally, the limitations of the study are acknowledged, including the scope of institutions studied and methodological constraints, along with operational definitions of key concepts such as HEIs, IRs, metadata, and OA.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

This chapter reviewed related literature on identifying effective approaches for improving the uptake of institutional repositories (IRs) content in the Higher Education Institutions in Zambia. Therefore, this literature review was guided by the following themes derived from the study objectives; Institutional repository content status in HEIs; effective techniques for depositing legacy content; and self-achieving approaches

2.2 Scholarly Resource Output Extent in Institutional Repositories

Literature indicates Europe, America and Australia have a higher adoption rate of institutional repositories compared to other continents across the globe (Cullen and Chawner, 2010; Katayoon and Abrizah, 2010). According to Cullen and Chawner, (2010) in 2006, all Australian universities had functioning institutional repositories, and Europe leads other continents with 47.92% of universities having institutional repositories. Despite heightened adoption and usage of institutional repositories in developed countries, the rate of submission of scholarly works among American Universities is fairly low (Casey, 2012). According to published research, Thailand, Japan, Taiwan, and India are the Asian nations that have adopted and made the most use of institutional repositories. There are several reasons why institutional repositories are being used more frequently in Asia. These include user knowledge of quality control and archiving regulations, document availability in repositories, publication kinds, and software and system usability for institutional repositories (Okiki, Osedo, and Okpah, 2020). African nations have a low rate of institutional repository adoption compared to developed and Asian nations (Ezema, 2013). In Africa, the uptake of institutional repositories has not been encouraging. Several factors have contributed to this low adoption, including a lack of awareness about institutional repositories, unstable electricity, inadequate information, communication, and technology (ICT) skills, and a shortage of skilled labour (Christian PhD, 2009).

Using the global Directory of Open Access Repositories (OpenDOAR) and transparent ranking, Adam and Kaur (2022) conducted an exploratory study to determine the current state of institutional repositories implementation in African countries. They found that institutional repositories' typical performance is still below average. Furthermore, the research revealed that;

IRs in South Africa, Kenya, Nigeria, Algeria, Sudan, and Egypt showed a higher likelihood of supporting global open access to research results, compared to other African countries. The study concluded that; numerous organizations, institutions, and societies invest significant efforts in supporting open access implementation in Africa. However, the widespread implementation of IRs is still slow-paced, and the performance of the implemented repositories falls below expectations. This suggests that while there are efforts to improve open access in Africa, the progress is insufficient and slow.

According to Muneja (2010) and Mgonzo and Yonah (2014), the adoption and usage of institutional repositories in Tanzania has been low due to various factors such as inadequate content, poor accessibility, discoverability, and visibility of local content, as well as a lack of motivation and skills. These studies have shown that IRs in Tanzania have yet to be fully explored. However, a study by Nunda and Elia (2019) found that while students are aware of IRs and use them to access scholarly information, the adoption and usage of IRS is still low. The study also revealed that the majority of respondents were only moderately aware of institutional repositories. The findings of this study confirm those of previous studies on the usage of IRs in Tanzania. The development of IRs in East African countries, including Tanzania, has been slow, with DSpace being the most commonly used software.

Researchers and academic members of staff tend to deposit their publications on various databases such as Google Scholar[4], PubMed Central[5], Academia.edu[6], ResearchGate[7] and IRs. Authors can archive their publications in both Google Scholar and IRs. However, the choice of platform may depend on the type of content being archived. Google Scholar is primarily designed for scholarly articles such as journal papers, conference papers, technical reports, or their drafts, dissertations, pre-prints, post-prints, or abstracts.

In a study by Borrego (2017), the depositing practices of Spanish researchers in ResearchGate[11] and IRs of 13 top Spanish universities were compared. The study utilized Web of Science information for 13 Spanish universities, which were among the top 500 universities worldwide in the 2015 ARWU rankings. The findings revealed that only 11% of the articles published by

[4] https://scholar.google.com/
[5] https://www.ncbi.nlm.nih.gov/pmc/
[6] https://www.academia.edu/
[7] https://www.researchgate.net/

scholars affiliated with these top Spanish universities were available in their institutional repositories. Additionally, only 11.1% of the articles produced by the universities' academics in 2014 were accessible in their IRs in the first quarter of 2016. However, the majority of the papers (84.5%) that were not in institutional repositories were published in outlets that allowed some form of article deposit. On the other hand, 54.8% of the articles were fully accessible on ResearchGate[11].

The study highlights the relatively low presence of articles from top Spanish universities in their IRs, indicating a potential gap in the depositing practices of researchers. This emphasizes the need for further exploration of the factors influencing the depositing habits of scholars and the accessibility of their work in different platforms.

The 2018 Research Productivity of the UNZA is another study that presented the findings of a research productivity analysis of the UNZA in 2018 using selected bibliometric indicators[8]. The study collected data from various sources, including Scopus, PubMed, Google Scholar, UNZA IR, and UNZA Journals Online[12]. The study analyzed 516 publications using Microsoft Excel and visualized research themes based on keywords using VOSviewer. The study found that 366 academic staff participated in the total research output, giving a 39% participation rate. The research output was characterized by journal articles (79.8%) as the most preferred medium of publication and the study recommends converting traditional journals into online open access journals to improve research productivity[12]. Data was extracted from multiple sources, including Google Scholar, because the UNZA IR is not up-to-date.

Google Scholar is a popular academic search engine that is available for free and was founded in 2004[8]. It covers a broad range of fields and sources, including books, conference papers, theses, dissertations, preprints, abstracts, technical reports, and other scholarly publications. It indexes full-text and bibliographic data of scholarly literature. Google Scholar is the world's largest academic search engine, covering the majority of peer-reviewed online academic journals, books, and other scholarly publications, according to scientometric research by Gusenbauer (2019).

[8] https://zajlis.unza.zm/index.php/journal/article/view/76

2.3 Effective Techniques for Depositing Legacy Content

The effective techniques for depositing legacy content in IRs necessitate well-defined policies, training, support, automation, incentives, and collaboration. By incorporating these approaches, institutions can enhance the visibility and influence of their repositories, ensuring that valuable research outputs are preserved and accessible to the broader community (Callicott, Scherer and Wesolek, 2016). HEIs should establish clear-cut deposit policies that outline the accepted content types, the deposit procedures, and the required metadata. This can streamline the deposit process and guarantee the inclusion of all essential information

HEIs should provide training and support to researchers to help them understand the value of depositing their content in IRs. This can include workshops, online tutorials, and one-on-one consultations. Additionally, Institutions can automate the deposit process by integrating the repository with other systems, such as research information management systems and publication databases. This can help to reduce the burden on researchers and ensure that all necessary metadata is included.

Another important strategy for ensuring that legacy content is deposited is incentivizing deposit, where HEIs incentivize deposit by offering rewards or recognition for researchers who deposit their content in the IRs. This can help to encourage participation and increase the visibility of the repository. In addition Institutions can collaborate with other institutions to share content and increase the visibility of their repositories. This can include participating in consortia or networks, sharing metadata, and cross-referencing content, (Callicott, Scherer and Wesolek, 2016).

Phiri's research investigated the online visibility of scholarly research output in Zambia, particularly focusing on ETDs. The study, which involved a bibliometric analysis, revealed that out of the six public HEIs and 60 private HEIs in Zambia, only two HEIs had established IRs. However, these two institutions had low scholarly publications by academic staff, and there was a significant delay between the publication date of the ETDs and their ingestion into the IRs (Phiri, 2018).

The study highlighted the challenges related to the online visibility of scholarly research output in Zambia, emphasizing the limited presence of IRs in the country and the delay in archiving research outputs. This has implications for the accessibility and dissemination of research from

Zambian academic institutions. Efforts to improve the visibility of research output in Zambia have included the establishment of open-access repositories and adopting of repository policies, with some progress being reported in increasing the visibility of research outputs through these initiatives (Phiri, 2018b).

Additionally, Phiri's study outlined technological initiatives, using case examples from the UNZA that can be employed to potentially increase the online visibility of HEIs' scholarly output. The study illustrated how subject repositories and downstream aggregate services can be utilized to increase the visibility of scholarly output.

The aforementioned findings align with a study by Akakandelwa, in which authorship patterns and collaboration were identified through publication analysis. The study involved an examination of papers authored by academic staff at the UNZA between 2002 and 2007, which were obtained from the Thomson Scientific database. The findings revealed that the average publication count was 36.7, with the highest publication count recorded in 2006 being 63 (Akakandelwa, 2009).

This study by Akakandelwa provides insights into authorship patterns and collaboration among academic staff at UNZA during the specified period. The research contributes to the understanding of research productivity and collaboration dynamics within the academic environment, particularly at UNZA. The findings of this study, along with other related research on author collaboration and productivity, offer valuable information for assessing and enhancing scholarly output and collaboration patterns among academic staff at UNZA and similar institutions.

2.4 Self-Archiving Approaches

The process of adding digital objects to IRs can be carried out through self-archiving, where manuscript authors are responsible for depositing the manuscript, or by a central authority, typically the Library (Harnad, 2001). While self-archiving has received significant support, particularly in the context of IRs, there are still challenges. A study conducted in eight universities in Malaysia revealed that the ingestion of digital objects into repositories is primarily performed by librarians rather than authors (Katayoon and Abrizah, 2010).

The ingestion of digital objects into IRs is a common challenge faced by HEIs. To address this challenge, the use of subject repositories has been proposed as a feasible approach to effectively ingest digital objects into IRs (Phiri, 2021). This approach presents opportunities to decentralize the ingestion of digital objects, potentially improving the overall process.

(Mbughuni, Mtega and Malekani, 2022) investigated how academic staff members participated in Tanzanian public universities' open-access IRs by depositing locally created content. The purpose of the study was to determine how much academic personnel were contributing locally created content to IRs with open-access. The research design for the study was cross-sectional, and structured questionnaires were used to gather data from 292 academic staff members who were chosen by systematic random sampling. In addition, 14 key informants were chosen using purposive sampling. The findings show that 46.2% of respondents have self-archived their academic work in open access IRs, and 92.5% of respondents were aware that such repositories existed. Insufficient internet access, limited bandwidth, and an unreliable power source caused delays for the faculty members while attempting to upload their work (Mbughuni, Mtega and Malekani, 2022).

Mohamed (2012) studied an end-to-end solution for complicated educational materials with the primary goal of giving educators and content providers a way to make the process of depositing content into digital repositories easier. To generate packages and adhere to a deposit protocol for ingesting materials into repositories, he developed a desktop tool known as the Open Educational Materials Depositor (ORchiD) that incorporates educational metadata and content packaging standards (Mohamed Nour, 2012). Users' assessments of the tool revealed its potential to simplify the repository deposit procedure, which would promote the production of OERs and motivate content creators to share.

Additionally, to address complaints from users that IR deposits are time-consuming for self-arching, the Extracting Metadata to Load for Open Access Deposits (EM-Loader) project was introduced. According to this project, most academics need to maintain professional personal websites listing and linking their publications. Therefore, this project aims to reduce this effort in that it enables easier deposit of research papers through bulk upload of bibliographic metadata and links to a system designed for publication list management on a webpage (Howel and Stuart, 2009).

The above project is similar to the Open Access Repository Junction (OA-RJ) project, which aims at simplifying the deposit of resources from publishers to repositories. The main objective of this project is to allow publishers to deposit into multiple repositories at once instead of performing one deposit to various repositories (CaMel caSEd, 2009).

Chakulya et al. (2021) conducted a study of effective tools for self-archiving in institutional repositories at UNZA. A qualitative approach involving online questionnaires and interview guides through the use of Google Meet was used to collect data using convenience sampling. In analyzing the content that each school deposited from 2000 to 2013, the findings show that among the 13 schools that exist at UNZA, the School of Education has the highest number of deposited content on the IR, followed by the School of Agriculture and Library, then the School of Humanities, University Collection, Natural Science, Veterinary Medicine, Institute of Economic, Engineering, Mines, Institute of Distance, and the School of Law, which shows the lowest number of deposited content on the IR (Chakulya, Chileshe and Kangwa, 2021).

In analyzing the trends in the upload of content from the year 2000 to 2013, the findings indicate that 2000 to 2006 had a very low uptake of content in the IR (less than 20%). with 2011 being the highest in that period, followed by 2012 and then 2013 (Chakulya, Chileshe, and Kangwa, 2021).

Chakulya et al. implemented the self-archiving software tool, which is a web-based application, through the use of MERN STACK technology. The tools are meant to change the monotonous way of interacting with the IR at UNZA, which will in turn reduce or cut down on some of the long processes involved (Chakulya, Chileshe and Kangwa, 2021). According to Chakulya (2021), the user-friendly Self-Archiving Tool (SAT) will not only improve the way scholars archive their work but also increase the uptake of faculty staff-authored pre-prints and post-prints and ETDs in the IR UNZA. This shows that self-archiving has not lost all hope and value; it just needs improvement, and that is what the SAT tool aims to improve, which is the practice of self-archiving at UNZA (Chakulya, Chileshe and Kangwa, 2021).

In attempting to uncover the motivations associated with self-archiving behavior and factors that make faculty reluctant to self-archive, Kim proposes a model of factors that influence self-archiving behavior. Kim cites “additional time and effort” and “technical skills” as having negative and positive associations, respectively (Kim, 2011).

In a study of the awareness and self-archiving practices of Kenyan academics in five universities, the findings suggest that the awareness and attitude of academics are low, with the vast majority supporting mandatory open access policies (Chilimo, 2016).

Most universities face the problem of low uptake of IR content due to a lack of self-archiving practices (Phiri, 2018).

2.5 Summary

In summary, the literature review delves into various aspects related to improving the uptake of institutional repositories (IRs) content in Higher Education Institutions (HEIs) in Zambia. The review is structured around the study objectives, focusing on three main themes: the status of institutional repository content in HEIs, effective techniques for depositing legacy content, and self-archiving approaches.

Regarding the status of institutional repository content in HEIs, the review highlights global disparities in IR adoption, with developed countries such as Europe, America, and Australia leading in adoption rates compared to Africa and Asia. Factors influencing adoption include awareness, infrastructure, and ICT skills. In Africa, including Zambia, adoption rates remain low due to various challenges such as lack of awareness, unstable electricity, and inadequate ICT skills. Studies conducted in Tanzania and Zambia reveal low adoption rates and limited online visibility of scholarly research output.

Effective techniques for depositing legacy content in IRs are discussed, emphasizing the importance of clear deposit policies, training, support, automation, incentives, and collaboration. Studies highlight challenges such as delays in archiving research outputs and the predominance of librarian-led ingestion. Strategies to address these challenges include subject repositories, integration with other systems, incentivizing deposit, and collaboration.

Self-archiving approaches are explored, focusing on initiatives to simplify the deposit process and increase faculty engagement. Studies from Tanzania and Kenya reveal low awareness and reluctance among academics to self-archive, despite support for open-access policies. Tools such as ORchiD and EM-Loader aim to streamline the deposit process, while the introduction of web-based applications like the Self-Archiving Tool (SAT) at UNZA seeks to improve faculty

engagement and increase uptake of IR content. Challenges such as time constraints and technical skills are identified as barriers to self-archiving behavior.

Overall, the literature review provides insights into the complexities of IR adoption and content deposition in HEIs, highlighting the need for multifaceted strategies to improve uptake and increase the visibility of scholarly research output.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Overview

This chapter discussed the methodology and procedures that were used in the study. These comprise the research design, target population, sampling procedure, data collection instruments and procedures, methods of data analysis, and ethical considerations.

3.2 Philosophical Approach

This study is anchored in the post-positivist paradigm. Post-positivists believe that research is a process of logically related steps drawing multiple perspectives from participants rather than a single reality (Creswell and Creswell, 2017). The core assumption of this form of inquiry is that knowledge is conjectural; absolute truth can never be found. Therefore, evidence established in research is always imperfect and fallible (Creswell 2003). We chose to use this approach because the paradigm is characterized by being "reductionist, logical, empirical, cause-and-effect-oriented, and deterministic based on priori theories" (Creswell and Creswell, 2017). It holds a deterministic philosophy in which causes determine effects or outcomes. Therefore, the problems studied by post-positivists reflect the need to identify and assess the causes that influence outcomes, such as those found in experiments (Creswell, 2003). The flexibility of the paradigm allows for the development of alternative research strategies (Glicken, 2003).

3.3 Research Design

A research design is a plan or blueprint of how a researcher systematically collects and examines the data required to answer the research questions (Babbie and Mouton, 2001). While, according to Adèr (2008), a research design includes how data is to be collected, what instruments will be employed, how the instruments will be used, and the intended means for analyzing the collected data. On the other hand, a research design is a structure used in research that intends to show how all of the major components of the research project work together to tackle the central research questions (Kombo and Tromp, 2006).

This research employed a descriptive survey. A descriptive survey is a method of collecting information by interviewing or administering questionnaires to a sample of individuals. According to Creswell (2003), a survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. The study

used the descriptive survey research design because it uses both quantitative and qualitative research methods and it provides a comprehensive picture of the characteristics, behaviors, and attributes of a particular population or phenomenon, which can be valuable in informing future research and policy decisions.

3.3.1 Determining the Institutional Repository Content Status in HEIs in Zambia

3.3.1.1 Target Population

A population is defined as any group of individuals that have one or more characteristics in common that are of interest to the researcher; it is a universal set of units from which sampling is drawn. Therefore, to meet the goals and objectives of this study, the target population for the first objective involved surveying all 64 registered HEIs in Zambia, both private HEIs and public HEIs.

3.3.1.2 Selection Criteria

The research focused on academic members of staff and researchers at HEIs who have Google Scholar profiles. To achieve the study's goals and objectives, the following HEIs were part of the study: the University of Zambia (UNZA), Lusaka Apex Medical University (LAMU), Cavendish University (CU), Chalimbana University (CHAU), Copperbelt University (CBU), Kwame Nkrumah University (KNU), Mulungushi University (MU), University of Lusaka (UNILUS), ZCAS University (ZCAS), Information and Communication University (ICU), and Texila American University (TAU). The selection of these institutions was based on their inclusion in the list of 11 HEIs identified as having functional IRs by Chisale and Kasonde (2023)[9][10].

3.3.1.3 Sampling

The study conducted a census of all the academic members of staff and researchers that have Google Scholar profiles for each of the 11 HEIs.

A sample is a small proportion of the population that is selected for observation and analysis (Brink, Van der Walt, and Van Rensburg, 2006). The author further mentions that a sample size consists of a selected group of elements, or units of analysis, from a defined population. While sampling refers to the researcher's process of selecting a sample from a population to obtain information regarding a phenomenon in a way that represents the target population (Brink, Van der Walt, and Van Rensburg, 2006),.

[9] https://ir.inflibnet.ac.in/handle/1944/2412
[10] https://ir.inflibnet.ac.in/handle/1944/2446

Purposive sampling, also called judgmental or authoritative sampling, was used to select academic members of staff or researchers with Google Scholar profiles from the HEIs. The researcher decided to use purposive sampling because the study focused on academic members of staff and/or researchers who have a Google Scholar profile. Purposive sampling is a non-probability sampling technique in which the sample members will be chosen only based on being an academic member of staff or researcher with a Google Scholar profile. Therefore, the researcher's knowledge and judgement were instrumental in creating a sample in this study, as it resulted in obtaining accurate results with a minimum margin of error.

3.3.1.4 Procedure

The researcher followed the following steps to extract publications from Google and IRs:

i. The researcher used Google Scholar to search for researchers with Google Scholar profiles; for instance, with UNZA, the researcher searched for profiles matching "University of Zambia" and then extracted those profiles.
ii. The researcher then extracted publications associated with each author matching the institution using Publish or Perish[11].
iii. The researcher extracted publications for each of the HEIs to meet the goals and objectives of this study, the authors, from their respective IRs
iv. The researcher matched publications from Google Scholar and IRs

The procedures above are discussed in detail below:

a) Google Scholar Publications

The researcher extracted author publications from Google Scholar profiles using Publish or Perish[15] software, which is a program that retrieves and analyses academic citations. The researcher downloaded Publish or Perish [15]. For all the academic members of staff and researchers that have Google Scholar profiles from each of the 11 HEIs, the researcher got the Google Scholar profile name of each Google Scholar profile and pasted it into the Publish or Perish search interface under Google Scholar profile and clicked search. Once the profile had been selected, Publish or Perish retrieved the profile information from Google Scholar, and it

[11] https://harzing.com/resources/publish-or-perish

showed the results list and calculated the citation metrics, which were saved by clicking save results and choosing to save as CSV.

b) Institutional Repository Publications

The researcher extracted publications from the IRs using the Open Archive Initiative Protocol for Metadata Harvester (OAI-PMH)[12], which is a protocol developed for harvesting metadata descriptions of records in an archive so that services can be built using metadata from many archives. Publications from the IRs who have activated the OAI-PMH were extracted using the OAI-PMH[16]. The researcher first got the URL for each IR and visited the OAI-PMH website to open the interface for OAI-PMH. The researcher then selected the download XML interface and entered a valid Uniform Resource Locator (URL) for the IR, then clicked the download interface to download.

For the HEIs that did not activate the OAI-PMH, the extraction was done using Octoparse[13]. Octoparse is a cloud-based web data extraction solution that helps users extract relevant information from various types of websites. It enables users from a variety of industries to scrape unstructured data and save it in different formats, including Excel, plain text, and HTML.

Octoparse was used to extract data from IRs from HEIs that had not activated the OAI-PMH. To extract author publications from IRs using Octoparse, the researcher downloaded the software and created an account. The researcher opened Octoparse, created a new task, and entered the URL of the IR from which they wanted to extract data. The researcher used the built-in tools in Octoparse to navigate to the page where the author publications are listed and used the Loop Item command to loop through each publication and extract the relevant data, such as the title, author, URL, and publication date. Last but not least, the researcher saved the extracted data in a format of their choice, such as Excel, JSON, or CSV. For this research, the researcher saved the extracted data in CSV.

c) Institutional Repository Uptake

The uptake of the scholarly resource output in IRs for each sampled academic member of staff with a Google Scholar profile from each selected HEI was determined by comparing the number

[12] https://validator.oaipmh.com/
[13] https://www.octoparse.com/

of publications archived to the Google Scholar profiles against what each sampled academic member of staff or researcher has archived to the IR.

This is because many researchers and/or academic members of staff will neglect to upload content to the IRs, but it tends out that quite a number of them will upload content to these publicly accessible academic databases. For instance, it is fairly common to have academics or researchers upload their publications on Academia.edu, Research Gate, PubMed Central, or Google Scholar, as opposed to uploading on the IR. It is for this reason that this study opted to use Google Scholar as part of the comparison for academic members of staff with a Google Scholar profile.

3.3.1.5 Data Analysis

The collected data was analysed by creating a spreadsheet for each sampled academic member of staff with a comprehensive list of all their publications, including the full details such as the publication date, author names, title, and their actual Uniform Resource Locator (URL) for both the publications uploaded to the IR and those uploaded on Google Scholar, and these publications were marched to ascertain the content status in IRs against Google Scholar.

3.3.2 Effective Techniques for Depositing Legacy Content and Self-Achieving Approaches

3.3.2.1 Target Population

The research targeted academic staff and researchers who publish at HEIs with Google Scholar profiles who have been identified under the first objective. Additionally, the Assistant Deans-Research or persons who are charged with the responsibility of compiling quarterly reports in the schools and faculties in HEIs, and it also targeted librarians who are charged with the responsibility of managing and submitting content to the IRs in HEIs because they have had training or acquired the knowledge relating to the research at hand.

3.3.2.2 Selection Criteria

Academic staff and researchers were selected because they publish at HEIs and have Google Scholar profiles. Assistant Deans-Research/Research Coordinators were selected because they are responsible for compiling research reports in their respective schools or faculties. Librarians were specifically chosen based on being in charge of managing and uploading content to institutional repositories.

3.3.2.3 Sampling

A sample is defined as a proportion of a given population (Polit et al., 2001). Therefore, the sample chosen for the study was as follows: we interviewed 29 respondents from the 13 schools at UNZA Great East Road Campus and Ridgeway Campus. This included the 13 Assistant Deans of Research, one from each school; 13 academic staff members or researchers, one from each school; and three librarians, including the one who is in charge of overseeing the IR and is knowledgeable about the subject, who were interviewed.

Additionally, we conducted interviews with 21 respondents from the other seven HEIs that had functional IRs; these included one researcher or academic member of staff from each HEI, one person in charge of overseeing research and compiling research reports from each HEI, and one Librarian in charge of managing the IR from each HEI.

Purposive sampling, also called judgmental or authoritative sampling, was used to select academic members of staff and researchers who publish.

3.3.2.4 Procedure

The academic members of staff were ranked according to the number of publications they have authored, and those who had significant differences between what they uploaded on their Google Scholar profiles against what was ingested on the IR were listed according to the number of publications. In addition, the researcher employed random sampling to select academic members of staff from the list based on their availability at the time of the interview.

A semi-structured interview guide (Appendix B) was used for collecting data because it allowed participants to share their personal experiences, opinions, and feelings about the topic under study. Additionally, semi-structured interviews allowed the researcher to be focused on the topic of interest while still enabling participants the autonomy to explore relevant ideas that may come up during the interview. The interviews were conducted both in person and using video conferencing tools such as Google Meet[14]. The in-person interviews were recorded using a reordering device, while the Google Meet interviews were recorded using tl;dv[15], TLDV is an abbreviation for "Too Long; Didn't View." which is an AI-powered meeting recorder and

[14] https://meet.google.com/?hs=197&authuser=0

[15] https://tldv.io/?gclid=CjwKCAiAtt2tBhBDEiwALZuhABqaHdOLrE3R7_pfQlB8DfxZcFuCxiQhjcB3m4Cfs2d0pPPV6oAa3BoCgqMQAvD_BwE

transcriber designed to capture, transcribe, and share online meetings on platforms like Google Meet and Zoom.

3.3.2.4 Data Analysis

Qualitative data refers to non-numerical data that approximates and characterises qualities or characteristics, and qualitative data analysis deals with the transformation of raw data by searching, evaluating, recognising, coding, mapping, exploring, and describing patterns, trends, themes, and categories in the raw data to interpret them and provide their underlying meanings (Ngulube, Mathipa, and Gumbo, 2015). It is collected through various methods such as interviews and observations, is essential for understanding concepts, opinions, and experiences, and is analysed descriptively to identify patterns or themes.

The researcher executed the manual transcription of interview audio through the following steps: first, ensuring the recording device's high quality and optimal condition before the interview. Before commencing transcription, the researcher previewed the recording to grasp the interview's content and context. A transcription document template was then created, and the preferred transcription method involved a more concise verbatim approach, focusing on key points while typing out the spoken words verbatim. The resulting transcript underwent thorough proofreading to rectify errors or inconsistencies, ensuring an accurate representation of the conversation. To safeguard participant privacy, any identifying information deemed necessary was removed.

The researcher used thematic analysis to analyse the collected data. Thematic analysis is a method used to analyse qualitative data, such as opinions, thoughts, and feelings. It involves identifying common themes, topics, and patterns of meaning that emerge from the data. Consequently, the following procedures were taken into consideration as the qualitative data was examined thematically following the study's objectives and research questions.

To fully understand the content and context of the data, the researcher first reviewed and reread the data that had been captured during an interview, a process known as data logging. Together with recalling specific facial expressions or voiceovers that correlated with the respondents' responses to the question posed, the gathered data was transcribed. The data that was collected was then coded and arranged according to the study's objectives and research questions by creating preliminary codes. Subsequently, the themes were reviewed to refine and define the themes by reviewing and defining what each theme is about and checking if the themes work

concerning the coded extracts and the entire dataset. The results were reported using narratives, and some data was displayed in tables.

3.4 Ethical Considerations

Ethics refers to a system of right values that are concerned with the extent to which research procedures hold on to professional, legal, as well as social obligations to the study respondents (Dempsey, 2000). Therefore, in conducting this research, respondents were respected, and confidentiality, anonymity, and privacy were considered by explaining the objectives, methods, and anticipated benefits of the research beforehand. Participation in the study was voluntary, and the respondents' names and other confidential information obtained during the interview were not disclosed. The data obtained was analyzed and reported without any alterations to ensure honesty, truth, and objectivity. An informed consent (Appendix A) was availed to the participants to ensure that they understood the key elements of the study and what their participation entailed. Additionally, authorization was obtained from the Humanities and Social Sciences Research Ethics Committee (HSSREC) with the following reference number HSSREC:-2023 MAR-025 (Appendix E).

3.5 Summary

In summary, chapter 3 of the study looked into the methodology and procedures employed, focusing on the research design, target population, sampling methods, data collection instruments, data analysis techniques, and ethical considerations. The research design utilized a descriptive survey approach, combining quantitative and qualitative methods to provide a comprehensive understanding of the characteristics and behaviors of the target population. The study targeted academic staff, researchers, Librarians and Assistant Deans at selected Higher Education Institutions (HEIs) in Zambia, employing purposive sampling to ensure accurate results with minimal error margins. Data was collected by extracting publications from Google Scholar profiles and Institutional Repositories (IRs), with a focus on comparing the content status in IRs against Google Scholar. The chapter also discusses effective techniques for depositing legacy content and self-archiving approaches, detailing the target population, selection criteria, sampling methods, and data analysis procedures. Ethical considerations were paramount throughout the research process, ensuring respect for respondents, confidentiality, and voluntary participation.

CHAPTER 4

PRESENTATION OF FINDINGS

4.1 Overview

This chapter presents the research findings for all the study objectives, encompassing the results of the comparative empirical study between Google Scholar publications and IR publications. It also outlines the effective approaches discovered for improving the uptake of IR content in HEIs in Zambia. The findings are organized thematically, aligning with the study's themes and objectives. Additionally, a comparative analysis was conducted, extracting publications from HEIs equipped with IRs and examining the output from both Google Scholar and IR sources.

Interviews were conducted with Assistant Deans-Research, librarians, and academic members of staff who have a huge margin in terms of their publications on Google Scholar profiles against what they have on the IR. The specific objectives of the study were: determining the IR content status in HEIs in Zambia; identifying effective techniques for depositing legacy content; and self-achieving approaches.

4.2 Institutional Repository Content Status in HEIs in Zambia

4.2.1 Academic Staff Complement vs Google Scholar Profiles

The table below shows the staff complement at the HEIs versus the number of academic staff with Google Scholar profiles.

Table 4.1: Academic Staff Complement vs. Google Scholar profiles

Higher Education Institution	Academic Staff Complement	Number of Google Scholar Profiles
UNZA	800	661
ZCAS	39	16
MU	139	13
CHAU	150	13
LAMU	85	11
NKU	80	14
CBU	379	134
TAU	40	9
UNILUS	80	29
ICU	55	13
CU	65	13

Out of the 11 HEIs, publications were extracted from 8 HEI IRs, as shown in the table below. Publications were not extracted from the other 3 HEI IRs because, at the time of data collection, the IRs for CBU, KNU, and TAU were not functional.

Table 4.2: Google Scholar Publications in the IR and Publications not in the IR

	UNZA	UNILUS	ZCAS	MU	LAMU	ICU	CHAU	CU
Total Google Scholar Publications	15027	400	359	738	151	14	106	167
Google Scholar Publication in IR	1418	2	124	31	40	2	18	3
Google Scholar Publication not in IR	13609	398	235	707	111	12	88	164

4.2.1 Annual Trend and Uptake of Google Scholar and IR publications for each Institution

4.2.1.1 The University of Zambia Annual Trend and Uptake of Google Scholar and IR

The yearly Google Scholar and IR publications at UNZA showed a fluctuating trend in IR adoption. The IR uptake started at 4% in 2010 and gradually increased to 74% in 2011 and peaked to 88% in 2013. However, it gradually decreased to 8% in 2016, followed by 15% in 2020, and it further dropped to 6% in 2023, with fluctuations in between. This indicates a fluctuating trend in IR uptake over the years at UNZA, with both increases and decreases in uptake observed.

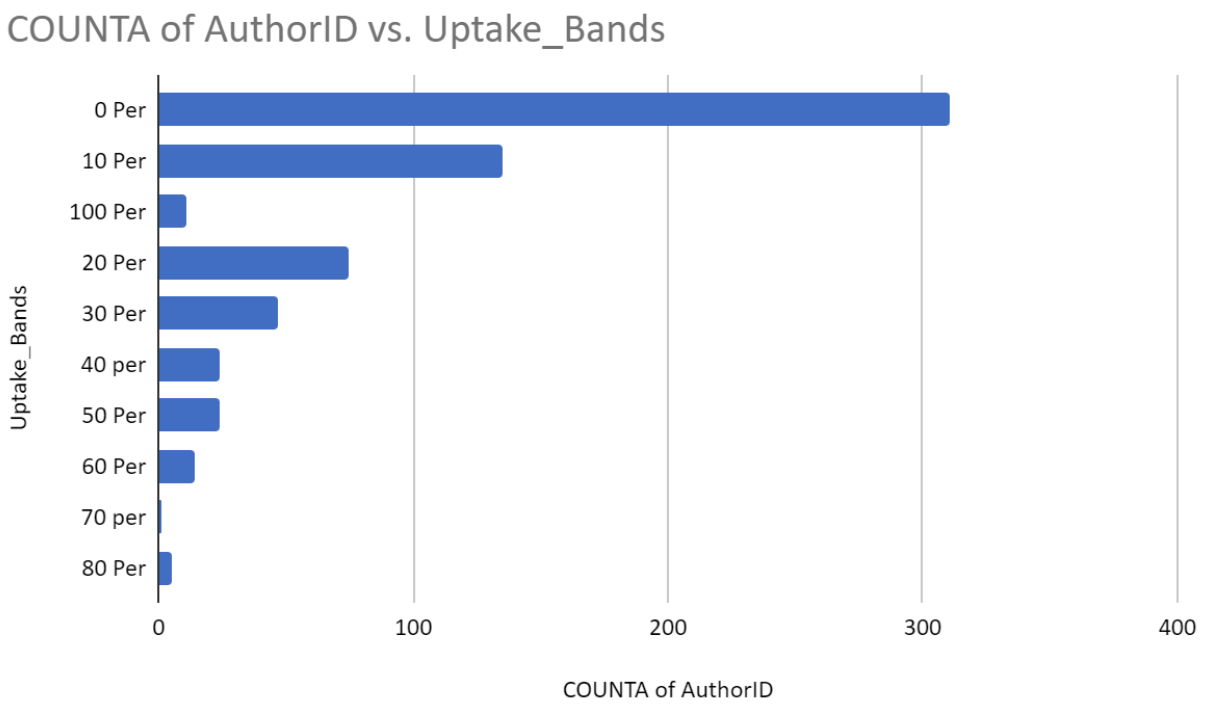

Figure 4.1: UNZA Institutional Repository Uptake

The data in Figure 4.2 above indicates that a significant number of academic staff and researchers (311) at UNZA have no publications in the IR. Following this are 135 individuals with only 10% of their publications in the IR, 75 individuals with 20% in the IR, 47 individuals with 30% in the IR, and 24 individuals with 40% and 50% in the IR. Additionally, 14 individuals have 60% of their publications in the IR, and only 11 individuals have 100% of their publications in the IR. On average, the IR uptake rate for researchers and academic staff at UNZA is very low, at 11% based on the individual uptake mentioned above.

4.2.1.2 ZCAS University Annual Trend and Uptake of Google Scholar and IR Publications

The annual trend of Google Scholar and IR publications at ZCAS University showed a gradual increase from 40% in 2014 to 67% in 2016, then a gradual decrease to 26% in 2017, 11% in 2018, and 18% in 2019. However, the uptake increased again to 50% in 2023. This indicates that there was a gradual increase and decrease in IR uptake over the years. In terms of the uptake, this shows that there is no consistent increase in the uptake. The expectation is that when you deploy the IR, it will result in a gradual increase in uptake because more and more people are going to be using it.

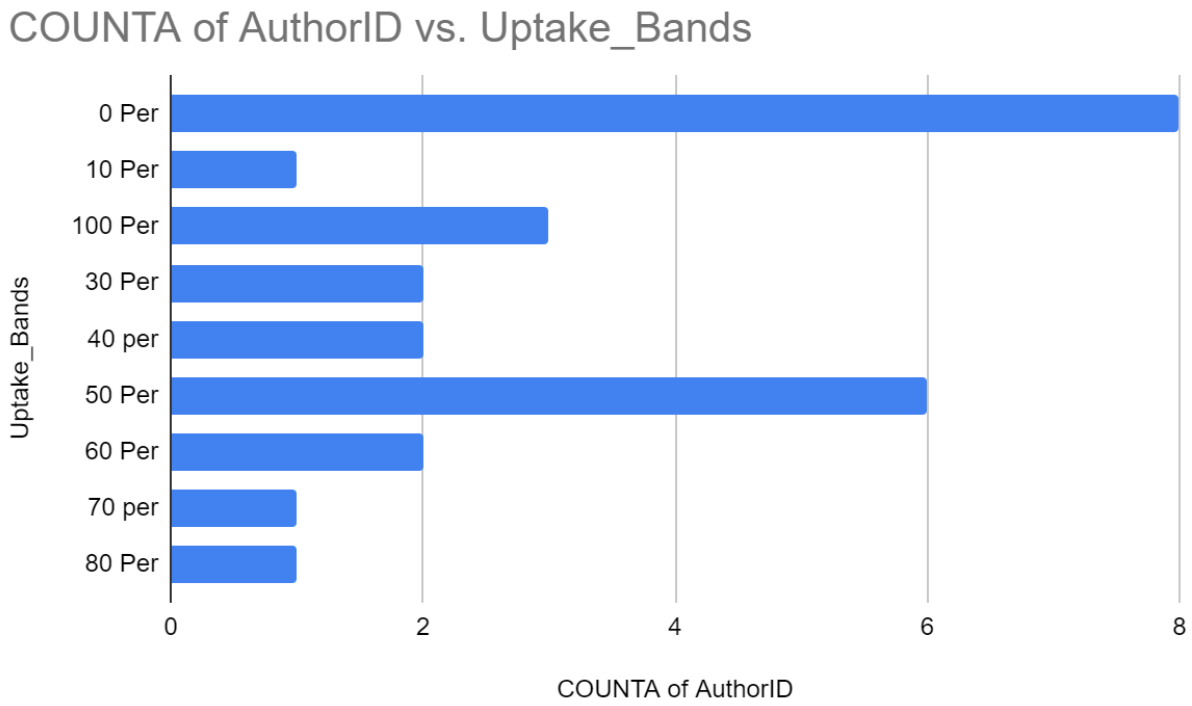

Figure 4.2: ZACS Institutional Repository Uptake

The chart in Figure 4.2 above shows that the majority, eight of academic staff and researchers at ZCAS, have no publications in the IR. Following this, two have 30% of their publications in the IR, another two have 40% in the IR, two have 60%, one with 70% in the IR, another one with 80%, and one with 100% of their publications in the IR. Based on the aforementioned individual uptake, the average IR uptake rate for researchers and academic staff at ZCAS is at 37%.

4.2.1.3 Lusaka Apex Medical University Annual Trend and Uptake Google Scholar and IR Trend

The yearly pattern of LAMU in terms of Google Scholar and IR publications. The IR uptake began at over 100% in 2008, decreased to 0% in 2011, rose to 67% in 2018, and then fluctuated to 50% in 2019, 42% in 2020, and 81% in 2021, and subsequently dropped to 58% in 2022 and 38% in 2023. This indicates a fluctuating trend in LAMU IR uptake over the years, with both increases and decreases observed.

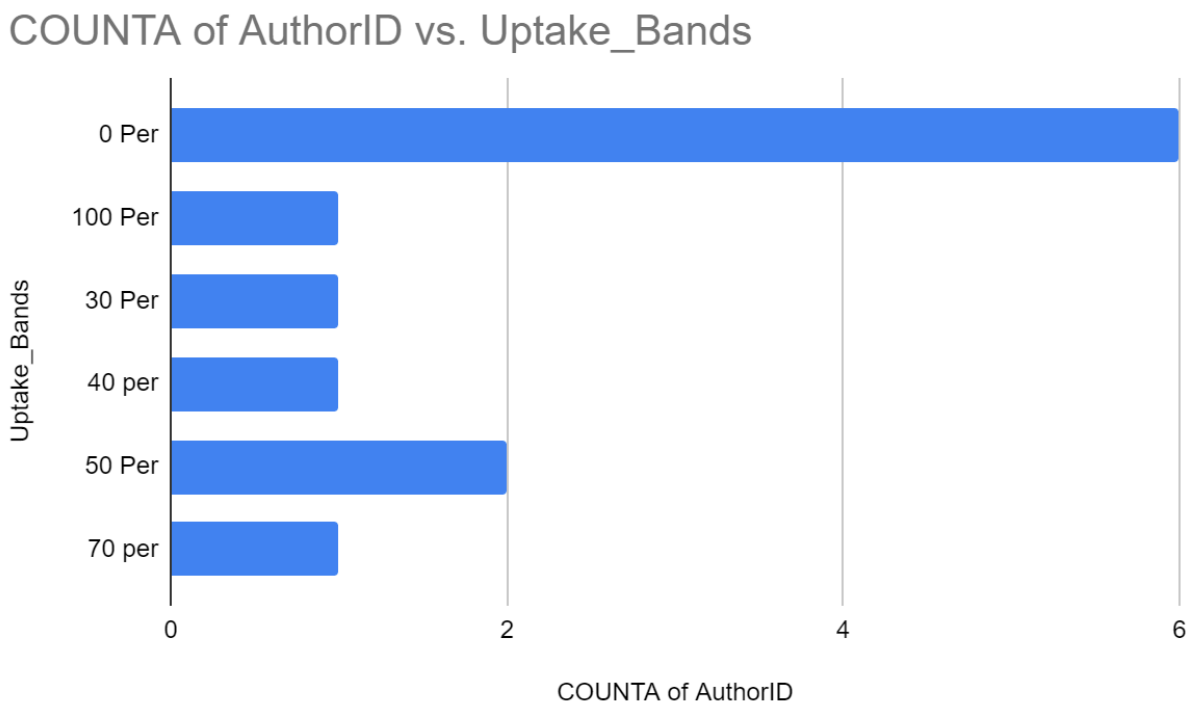

Figure 4.3: LAMU Institutional Repository Uptake

The data in Figure 4.3 above shows that a notable number of academic staff and researchers at LAMU (6) have no publications in the IR. Subsequently, one individual has 70% of their publications in the IR, two individuals have 50% in the IR, one has 40% in the IR, and another has 30% of their publications in the IR. On average, the IR adoption rate for researchers and academic staff at LAMU is quite low, at 28% based on the individual adoption rates mentioned above.

4.2.1.4 Mulungushi University (MU) Annual Google Scholar and IR Trend

The MU annual trend for Google Scholar and IR publications is seen in Figure 9 above. The IR uptake started at 7% in 2011, gradually increased to 16% in 2015 and 17% in 2017. The IR trend steadily declined, reaching 4% in 2019, 7% in 2020, 1% in 2021, and 0% in 2022 and 2023, respectively, for IR uptake. Unlike the Google Scholar publications of the academic members of staff and researchers at MU, the IR uptake gradually reduced, indicating a decrease over the years.

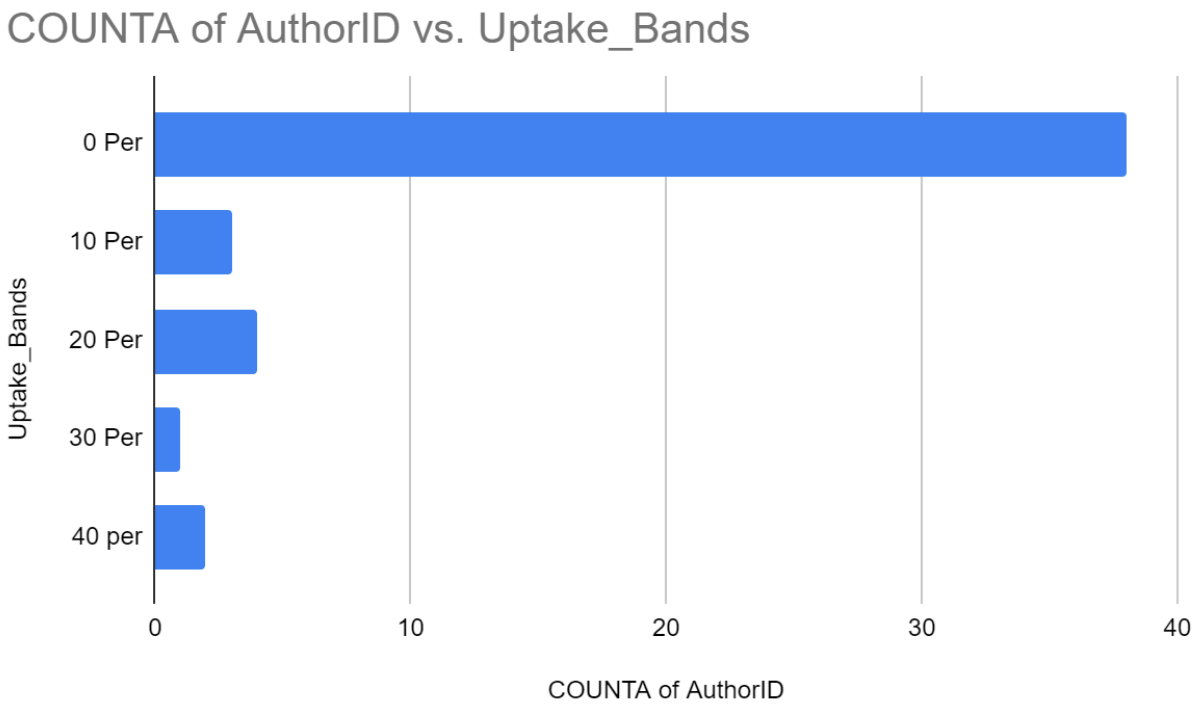

Figure 4.4: MU Institutional Repository Uptake

The data presented in Figure 4:4 indicates that the majority, 38% of academic staff and researchers at MU, have no publications in the IR. Subsequently, three individuals have 10% of their publications in the IR, four have 20%, one has 30%, and another one has 40%. On average, the IR uptake rate for researchers and academic staff at MU is very low, at 4% based on the individual uptake mentioned above.

4.2.1.5 Chalimbana University Annual Google Scholar and IR Trend

The annual trend of Google Scholar and IR publications for CHAU started at 25% in 2017, gradually increased to 50% in 2018, and then steadily declined to 43% in 2019, 30% in 2021, and 0% in 2022 and 2023, respectively. This indicates a gradual increase and decrease in IR uptake over the years, with no consistent increase in uptake.

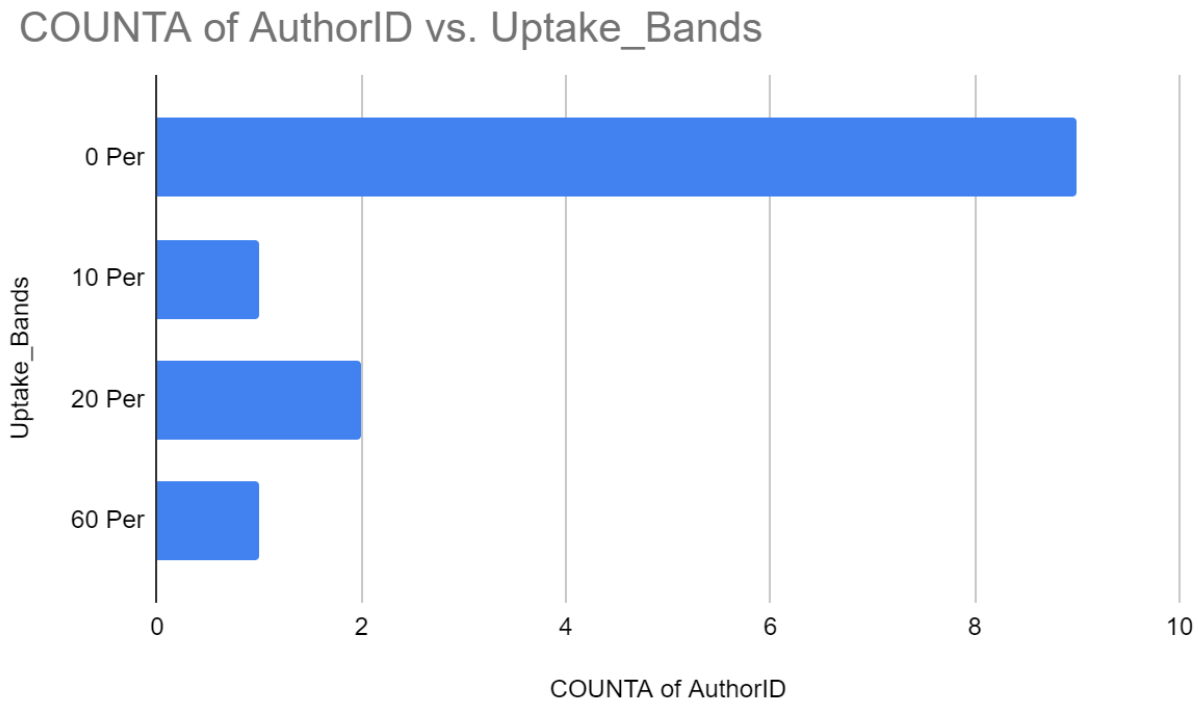

Figure 4.5: CHAU Institutional Repository Uptake

The chart in Figure 4.5 above illustrates that the majority, nine of academic staff and researchers at CHAU, have no publications in the IR. Subsequently, one individual has 10% of their publications in the IR, two have 20% in the IR, and one has 60% of their publications in the IR. Based on the mentioned individual uptake, the average IR uptake rate for researchers and academic staff at CHAU is 7%.

4.2.1.6 University of Lusaka Annual Google Scholar and IR Trend

The annual trend of IR and Google Scholar articles for UNLUS started at 5% in 2019, the IR uptake decreased progressively to 3% in 2021, 0% in 2022, and 0% in 2023. This suggests that IR uptake has gradually decreased over time rather than consistently increasing.

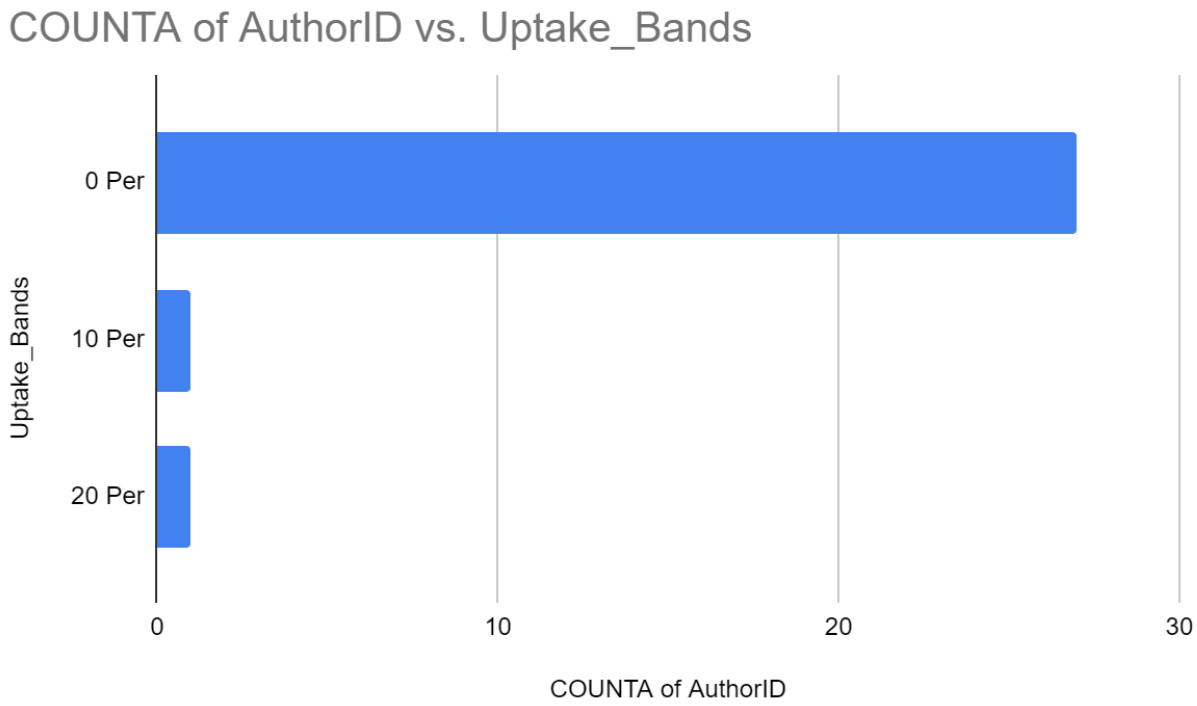

Figure 4.6: UNILUS Institutional Repository Uptake

The chart in Figure 4.6 above indicates that the majority, 27% of academic staff and researchers at UNILUS, have no publications in the IR. Subsequently, one individual has 10% of their publications in the IR, and another one has 20% in the IR. None of the academic staff included in the study had 50% or more of their publications in the IR. Based on the mentioned individual uptake, the average IR uptake rate for researchers and academic staff at UNILUS is 0.8%.

4.2.1.7 Information and Communication University Institutional Repository Uptake

The annual trend of Institutional Repository (IR) and Google Scholar publications for ICU began at 2% in 2017 and then steadily decreased to 0% in 2018 to 2023. This suggests that IR uptake has gradually decreased over time.

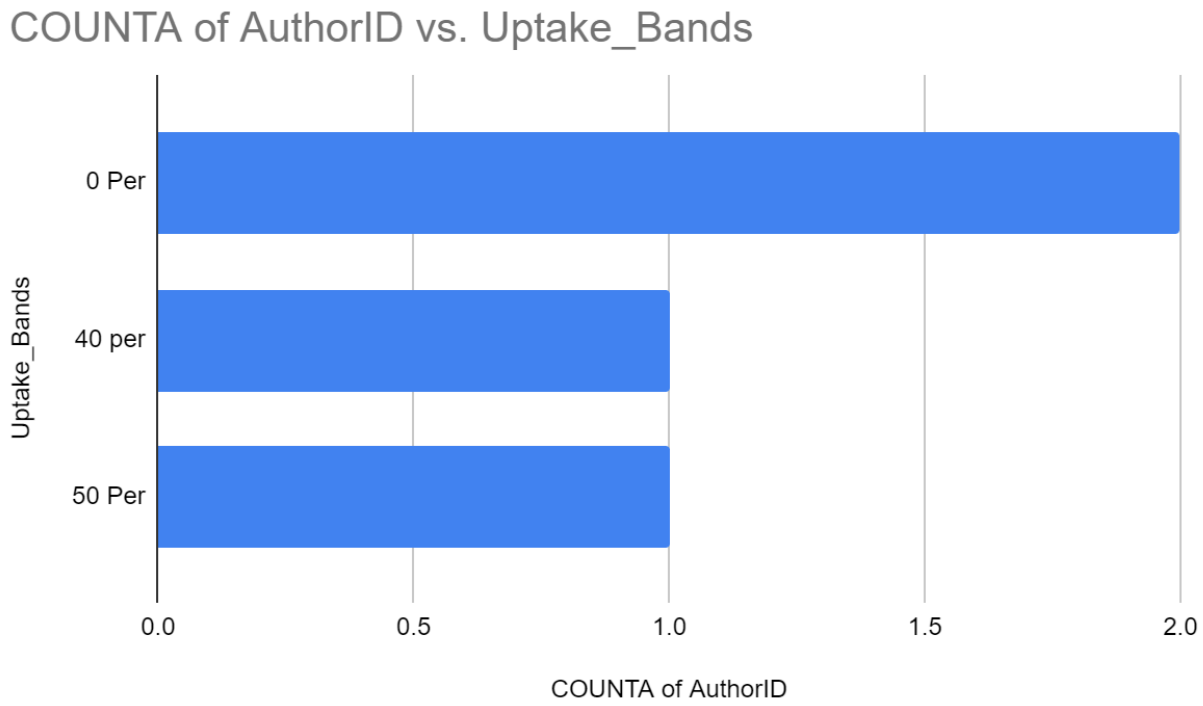

Figure 4.7: ICU Institutional Repository Uptake

The chart in Figure 4.7 above shows that the majority, two of the academic staff and researchers at ICU, have no publications in the IR. Subsequently, one individual has 4% of their publications in the IR, and another one has 50% in the IR. Based on the mentioned individual uptake, the average IR uptake rate for researchers and academic staff at ICU is 20%.

4.2.1.8 Cavendish University Annual Trend in Google Scholar and IR Publications

The annual trend of Institutional Repository (IR) and Google Scholar publications for CU began at 9% in 2016, then decreased to 6% in 2017, increased again to 9% in 2020, and was 0% in 2021, 2022, and 2023, respectively. This indicates a fluctuating trend in CU IR uptake over the years, with both increases and decreases observed.

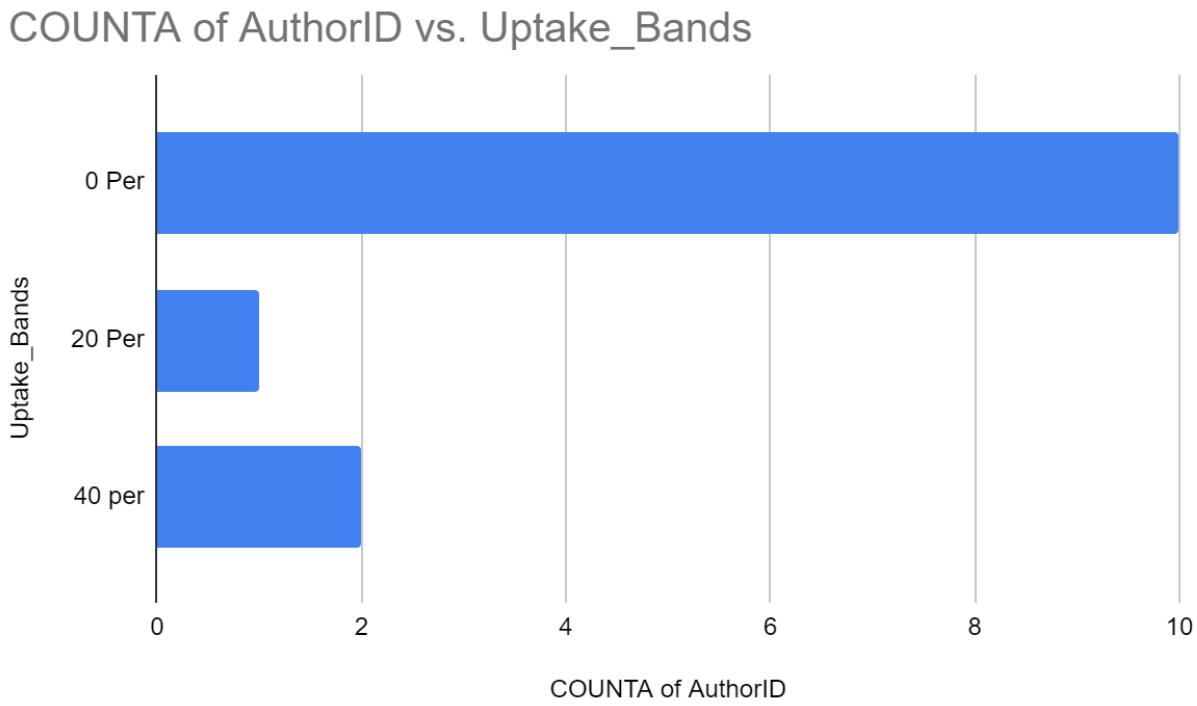

Figure 4.8: ICU Institutional Repository Uptake

The majority of academic staff and researchers at CU, accounting for 10%, have no publications in the Institutional Repository (IR). Subsequently, one individual has 20% of their publications in the IR, and two have 40% in the IR. None of the academic staff included in the study had 50% or more of their publications in the IR. Based on the mentioned individual uptake, the average IR uptake rate for researchers and academic staff at CU is 6%

4.3 Effective Techniques for Depositing Legacy Content and Self-Achieving Approaches

4.3.1 Academic Staff and Researchers

4.3.1.1 Participants' Demographics

Table 4:3 Demographic Characteristics

Demographic characteristics of Academic staff/Researchers		Frequency
Institutional affiliation of respondents	UNZA	13
	ZCAS	1
	MU	1
	CHAU	1
	LAMU	1
	UNILUS	1
	CU	1
	ICU	1
Work Experience	1 to 5 Years	2
	6 to 10 Years	6
	11 to 15 Years	3
	16 to 20 Years	6
	21 to 25 Years	0
	26 to 30 years	1
	above 30 years	1
Number of Publications per year on average	1	1
	2	7
	3	5
	4	2
	5	2
	6	2
Position	Vice Chancellor	1
	Deputy Vice Chancellor	1
	Professor	3
	Associate Professor	4
	Senior Lecturer	5
	Lecturer	3
	Head of Department	2

The study aimed at interviewing 20 academic staff from HEIs with operational IRs. That is 13 from UNZA and 7 from other HEIs. However, only 19 academic staff were interviewed, which is 95% of the intended number. The study found that the number of years worked for the institution varied among the respondents, with 2 having worked for 1–5 years, 6 for 6–10 years, 3 for 11–15 years, 6 for 16–20 years, 1 for 26–30 years, and 1 for 30 years and above. Among the respondents, there was 1 Vice Chancellor, 1 Deputy Vice Chancellor, 3 Professors, 4 Associate Professors, 5 senior lecturers, 3 lecturers, and 2 heads of departments.

4.3.2 Institutional Repository Uptake

When asked about the average number of publications each academic staff publishes per year, the study found that the majority (7) publish 2 publications per year. Following this, 5 academic staff publish 3 publications per year, with the rest varying in number: 2 academic staff publish 6 publications per year; 2 academic staff publish 5 publications per year; 2 academic staff publish 4 publications per year; and 1 academic staff publishes 1 publication per year. This distribution highlighted the varying publication rates among academic staff members, with some publishing more frequently than others.

When asked if they were aware of the IR and their responsibility for uploading publications to it, the results showed that, while the majority of respondents (10) were aware of the IR and their responsibility to submit content or publications to it, six were unaware of the IR and their responsibility to submit publications to it, and three were aware of the IR but not their responsibility to submit publications to it. The following were the responses:

*"Yes, I am aware of my role in submitting content to the IR." (*Participant 6). While participant 4 said, "*I am aware of the IR, but I discovered it late because I would have been a professor by now if I had submitted my publications early."*

"Yes, *I am aware of the IR; we submit our publications to the central place through the research coordinator, who later submits them to the library."*.

"I am not aware that I need to submit my publications to the IR. I was actually asking myself why my publications are not on the website. Because I am a visiting professor in South Africa

*and the librarians that side call and ensure that we submit our resources." (*Participant 7). "I am *not aware of the IR and my role in submitting publications to the IR."* (Participant 2).

"I know about the IR, but I don't know that I have a role to play in depositing publications." (Participant 8)

"I am aware that we have an IR, but I am not aware of my role in depositing my publications. I thought the university has a department that ensures that all the work we do is on the IR and also monitors what we do online."

Another respondent stated that *"I am aware of the IR, but the responsibility is on the lecturer. I'm not sure about that; even the publications I submitted that are now in the IR should have come from other authors."*

The above responses highlighted a range of awareness levels, from those who were fully aware of their role in submitting content to the IR to those who were unaware of the IR and their responsibility to submit publications. The study suggests that there may be a need for further education and communication about the IR and the role of academic staff and researchers in submitting their publications to the IR.

According to the findings, the majority of academic staff members upload their publications to Google Scholar, then Research Gate, Academia.edu, PubMed, and the IR, in that order. This is because Google Scholar uses a metric that scans various journals and updates the publications automatically.

"We don't really submit to Google Scholar; they just mop them up from various journals." (Participant 5).

"I don't submit to Google Scholar because it has a Metrix that scrawls and updates. I submit to Research Gate". (Participant 9)

*"Automatically, publications go to Research Gate and Google Scholar." (*Participant 10).

"Research Gate and Academia.edu, because these two platforms increase our visibility and citations." (Participant 15)

“In the Journal of Preventive and Rehabilitative Medicine, Journal for the UNZA School of Health Sciences, and Google Scholar." (Participant 4)

In response to the question of whether academic members of staff had noticed any differences between the number of publications they had on Google Scholar and the IR, the results showed that 58% (11) of academic staff members were not aware of the differences between the number of their publications on Google Scholar and the IR, while 42% (4) were aware. They stated that, compared to the IR, Google Scholar had more of their publications.

"No, I am not aware, because I don’t check the IR, so I don’t know what is on the IR. I only check Publish or Perish, Google Scholar, and Academia.edu. Basically, the publications that are in the IR are publications that I co-authored with someone else, so I am sure they are the ones who submitted.” (Participant 10).

*“I have never seen the IR. So I end up depending on Google Scholar, Research Gate, and Academia.edu. My thinking is that there should be someone at the library who actively searches for this information because it is in the public domain, and if they find anything with the UNZA email, then they upload it to the IR." (*Participant 15)

“I don’t take time to visit the IR; I thought that once I submit to the research coordinator, he submits to the librarian. So I don’t know what is in the IR." (Participant 3). *“I haven’t noticed the difference between my publications on Google Scholar and the IR; maybe it’s because I haven’t heard about the IR until now.* (Participant 1)

“I think I have more publications on Google Scholar than the IR, because the motivation is to be visible on Google Scholar and to improve my citations." I have put everything on Google Scholar. (Participant 9).

Yes, I am aware; the ones I published with this institution are in the IR. In my case, I am new at ZCAS University, so the publications that are missing are because I published them with my previous institution." (Participant 16).

From the information gathered above, it is evident that responses varied among participants, with some expressing limited awareness of the IR and relying on platforms like Google Scholar, Research Gate, and Academia.edu for visibility. Participants highlighted reasons for not noticing

the differences, such as not actively checking the IR, assuming submissions were handled by others, or focusing on platforms that enhance visibility and citations. Overall, the findings underscore a lack of awareness among academic staff and researchers regarding the differences in their publication presence between Google Scholar and the IR.

4.3.3 Uploading Legacy Content

The According to the study, when asked why academic staff members were not submitting their missing publications to the IR, 26% (5) of the respondents did not know about the IR, while (4) 21% said they were now aware and planned to submit their missing publications. Due to the library's previous claim that there was no space on Dspace, 21% (4) of the respondents did not intend to submit their missing publications. The other 16% (3) of the respondents submitted their missing publications to the IR, while the other 16% (3) of the respondents did not submit their publications to the IR because they found it to be a lot of work and time-consuming, and they believed that the library should be responsible for searching and uploading the missing publications to the IR.

"I haven't made any intentions because I didn't know about the IR until now that you have brought it to my attention. As a school of Health Sciences we have a journal, and most of the time we submit our publications to the journal. The title of the journal is ***Journal of Preventive and Rehabilitative Medicine." (***Participant 3)

"I was not aware; I thought the university pushed us to have the UNZA emails so that they could scrawl and find all our publications on Google Scholar. In other universities, like South Africa and Japan, these publications are automatically added soon after students are done with their studies. We submit these publications in the quarterly reports, so we thought that these were submitted to the library." (Participant 15).

"There was a time when we were told that the IR was full; I think that's why it's taking longer for my promotion. I should have been an associate professor by now. I also do not have the time to sit down and submit my content because I am busy with teaching. I have also met the criteria to be a professor, so I am more relaxed about submitting the missing publications." (Participant 16)

"I haven't had the intention to submit my missing publications to the IR because it is a lot of work. Why can't the library search for these publications on Google Scholar that are under

UNZA? If you managed to follow up on our publications on Google Scholar and found my publications, then the librarians can equally do the same. (Participant 4).

"Yes, I have submitted my Google Scholar profile ID and links to my work to the librarian. My publications are also available on ZOTERO, and I have given the librarian access to my account. So the librarian is able to view and access all my publications. (Participant 8).

"Well, *we submit our publications to the research coordinator, who in turn submits them to the librarian. And we don't receive any reports from the library to tell us about the difference in our publications between the IR and Google Scholar.* (Participant 9).

The study found that when asked if academic staff had readily available missing publications or legacy content that wasn't ingested on the IR, the results showed that 100% of the respondents had their missing publications readily available.

"Yes, I have readily available these missing publications, and I am willing to contact the librarian since you have shared the contact information for the library. This is very helpful; most of my publications are on Google Scholar. I was actually one of the first people to put my publications on Google Scholar, so I will share my Google Scholar profile with the library." (Participant 10).

The responses varied among participants, with reasons ranging from lack of awareness of the IR to concerns about workload and time constraints. Some participants mentioned submitting publications to other platforms like journals or Google Scholar, assuming the library would handle the IR submissions. Notably, all respondents had their missing publications readily available and expressed willingness to contact the librarian for submission, highlighting a potential gap in communication or understanding between academic staff and the library regarding IR submissions.

The majority of academic staff, when asked where to find their missing publications, indicated that they were readily available on their Google Scholar profiles. Additionally, they indicated that the missing publications could be found on Publish or Perish, on the promotion scoring tool for UNZA, on the ICU university journal, and on Springer. The academic staff also expressed their willingness to submit soft copies of the missing publications and share links to the journals they publish with the librarians so that they can access this information.

"*These missing publications can be found on my Google Scholar profile. I think the same way that you noticed that I have more publications on Google Scholar than on the IR, the librarians can also do the same."* (Participant 5).

"They *are on my Google Scholar profile; for some online publications, I can provide links. They don't need my permission to get my publications. If I need to make them available, I will provide the publications." (Participant 7).*

"I have my publication in the UNZA promotion scoring system. All our publications are also readily available on Publish or Perish and Google Scholar."

"ICU University has a journal and all our publications are available in this journal[16]*.* (Participant 1).

"My missing publications can be found in the Journal of Preventive and Rehabilitative Medicine—Journal[17] *for the UNZA School of Health Sciences."*

"Most of my missing publications are available on Google Scholar; I also have a number of publications in print journals such as the Zambia Journal of Library and Information Science, Vol. 2, Issues 1 and 2, 2014, and the African Journal of Library, Archives, and Information Science, Vol. 3, No. 1, 1993."

Participants expressed their willingness to submit soft copies of the missing publications and share links to the journals they publish with the librarians for easy access. Responses highlighted the availability of missing publications on personal profiles, online platforms, and specific journals, emphasizing the staff's readiness to provide access to this content for submission purposes.

4.3.4 Self-archiving Strategies

When asked about the challenges or barriers to self-archiving, the findings revealed that the majority 79% (15) of the respondents claimed they were unaware of both the IR and the difficulties associated with self-archiving. While the other 21% (4) indicated that the process is tiring and difficult to set aside time for self-archiving due to their busy schedules and that the procedure is lengthy with unclear submission guidelines.

[16] www.ismdr.net,
[17] https://journals.unza.zm/index.php/medicine

"Well, like I said earlier, I am not aware of the IR, so I don't know the challenges associated with self-arching." (Participant 6).

"Until now, I wasn't aware of the IR and the challenges associated with self-archiving."

"We don't self-archive, so I don't know of any challenges." (Participant 13), "*I have never self-archived, so I am not certain of the challenges.*

"The process is tiring; setting aside time from my busy schedule to self-archive is a challenge. It's hectic".

"The procedure is long with poor submission guidelines." (Participant 12)

In response to the question of whether academic members of Stat knew of any tools or resources that would aid in self-archiving, the majority 84% (16) said they were unaware of any tools that would aid in self-archiving, while the remaining 11% (2) said they were unsure about any such software or tools. The remaining five percent (1) suggested that the IR be connected to Google Scholar, which would facilitate self-archiving.

"I don't know any resources or systems."

"I think the IR can be linked with Google Scholar."

"I am not sure of any tools or resources that could be linked with the IR." (Participant 5)

Participants expressed a lack of knowledge regarding specific tools or resources for self-archiving, with a minority proposing a connection between the IR and Google Scholar as a helpful solution for self-archiving.

4.4 Assistant Deans Research, Deputy Vice Chancellors and Research Coordinators

4.4.1 Participants' Demographics

The intended number of Assistant Deans-Research, Coordinators, and Deputy Vice-Chancellors to be interviewed from the HEIs with operational IRs was 20. That is 13 Assistant Deans' Research from UNZA, one from each school, plus 7 Deputy Vice-Chancellor Research and/or Research Coordinators from the remaining 7 HEIs.

Nevertheless, nine Assistant Deans of Research from UNZA from the Schools of Education, Humanities and Social Sciences, Engineering, Nursing and Midwifery, Veterinary Medicine, Agriculture, Mining, and Health Sciences were interviewed out of the 20 respondents. And seven more from various universities (CU, MU, UNILUS, ZCAS, LAMU, ICU, and CHAU) were also interviewed.

Consequently, 16 respondents took part in the study; of them, 5 were Assistant Deans of Research, 4 were Acting Assistant Deans of Research, 1 was the Deputy Vice Chancellor-Research and Innovation, 3 were Directors of Research and Innovation, and 3 were Coordinators of Research.

4.4.2 Institutional Repository Uptake

When asked how many publications their schools and faculties produce quarterly, the findings revealed that the School of Education at UNZA had 35, the School of Engineering had 30, the School of Nursing and Midwifery had 12, the School of Veterinary Medicine had 10, the School of Natural Sciences had 10, the School of Humanities and Social Sciences had 40, the School of Agriculture Sciences had 20, the School of Mines had 5, and the School of Health Sciences had 15, while other institutions ZCAS 10, LAMU 20, UNILUS 20, MU had 38, CHAU 21, ICU 25, CU 20.

The study further revealed that all 16 respondents, when asked if they prepared quarterly reports, did so. Furthermore, when asked how easy it was to compile these quarterly reports, of these respondents, 10 found it easy to generate the reports, while 6 found it difficult. The respondents who found it easy to generate the reports attributed their success to receiving reports from the heads of departments on time, benchmarking, and funding academic members of staff and researchers for publishing. "It's *quite easy to generate the quarterly reports because I get reports from the heads of departments." "It's easy for us to generate reports because the School of Veterinary Medicine does a lot of benchmarking, so we use Google Scholar," stated another respondent. "Well, producing quarterly reports is simple since ZCAS compensates its researchers and academic staff for publications, which forces staff members to turn in their work."*

The respondents who found it challenging to produce quarterly reports attributed their difficulty to staff members' busy schedules, their inability to submit their research on time, and the lack of

an automated system that can track the research that academic staff members are conducting. "*It's not easy compiling the quarterly reports. I think UNZA needs a system where academic members of staff can enter their research, which will make it easy for us to generate reports. The Centre for Information and Communication Technologies (CICT) is currently piloting a consultancy and project management system. Since most research is tied to projects, this system could help capture the research output."* Participant 7 said that "*it's not quite easy because academic members of staff are busy and they tend to delay submitting the information."*

According to the study, when asked whose responsibility it was to ensure that the publications compiled in quarterly reports were uploaded to the IR, the majority of the respondents (10) said that the librarians were responsible for this task. 4 respondents said that DRGS is responsible, while 2 respondents said that Assistant Deans of Research and HODs are responsible.

"I think the library is responsible for ensuring that these publications, which are compiled in quarterly reports, are uploaded to the IR. My office, as Assistant Dean of Research, submits the quarterly reports to DRGS, so I don't know what DRGS does with these reports. We also upload the reports to the DRGS Google Drive. I think this should be raised in the research meeting so that we know who is responsible for submitting them to the library, and if it turns out that we are responsible, there should be a memo compelling us to submit to the library." (Participant 5).

"*Well, these days things at UNZA have been centralised so much to the departments, so I could be responsible even though it is not in my terms of reference as Assistant Dean Research at school level. At the departmental level, research coordinators, in conjunction with the HODs, compile research reports, and during departmental meetings, this could be addressed and academic members of staff can be asked if they submitted their publications to the library. And as I compile the reports, I can ask the HODs if they submitted the research reports to the library.*

I think the library should be proactive and collect this information. They should make a formal channel where they get this information, either from the schools or from DRGS, because the academic members of staff are very busy and might not have the time to make follow-ups about the publications.

In response to the question of whether or not they were aware that quarterly reports could be generated using the IR, 14 out of the respondents did not know that this could be done; the other 2 respondents were aware that this could be done.

"No, I am not aware that I can use the IR in generating the quarterly reports, because I know if I go to the IR, I will not find the latest publications because most academic members of staff don't submit their publications to the IR," stated participant 9.

Participant 4 said, *"No, I am not aware of using the IR in generating quarterly reports; honestly speaking, I did not know about the IR until now."*

"No, I am not aware. The fact that I don't know about the IR means I don't think the academic members of staff know about it, hence the need for sensitization."

"Yes, I am aware, but the problem is that in addition to publications, I also include conference attendance and anything that occurs in the field of research in my reports. Since some of these items might not be in the IR, I don't use them." said Participant 16.

4.4.3 Uploading Legacy Content

The study found that many academic members of staff and researchers had more publications uploaded to their Google Scholar profiles than what had been uploaded on the IRs in their various schools and faculties. When asked how the missing publications on the IRs could be captured, the findings demonstrated the necessity of educating academic staff members about the IR. This could equally be done by checking the Google Scholar profiles of the academic members of staff and extracting the missing publications; by linking the IR to Google Scholar; by visiting academic members of staff in the respective schools and requesting the missing information; or by checking the performance appraisal forms and working hand in hand with DRGS.

"I think sensitization on members of staff about the IR, including its importance and benefits to the university and individual academic members of staff, might not even be aware that they are supposed to submit publications to the IR. The reason why academic members of staff submit to Google Scholar is because they know the value of Google Scholar regarding their h-index, increase in citations, and, to some extent, promotion."

The librarians should visit us in our respective schools and sensitise the members of staff about the benefits and importance of the repository." *All this information is with the Directorate of Research and Graduate Studies (DRGS), as we submit all research activities and publications to DRGS quarterly. DRGS has a Google Drive where each school has a folder, so librarians can request publications directly from DRGS. Alternatively, DRGS might make this information accessible to the library.*

Participant 3 stated that "*Google Scholar is automated; it crawls and selects new publications every 20 hours. However, the IR content is manually entered, so the university must automate the IR to ensure that every publication with the university email domain is swept up. "The university should automate the system and integrate it with the academic promotion tool,"* stated participant 5*, "because every academic member of staff submits what they have published when they are applying for promotion."*

The results showed that staff members were made more aware of how important the IR is when they were asked about ways to make sure that old publications or legacy content by academic staff and researchers from the last few years that were not archived in the IR are uploaded and that future publications are uploaded quickly and correctly. The IR should be linked to Google Scholar, management should encourage members of staff to publish in credible open source journals, submission of publications to the IR should be compulsory, there should be clear IR policies, there should be strict policies that compels members of staff to use the institutional email address when publishing in credible open source journals, submission of publications to the repository should be compulsory, implementation of clear institutional repository policies, there should be strict policies that compels members of staff to use the institutional email address when publishing that they can be moped up by google scholar and uploaded to the repository, the library should have access to data career forms because we fill in our publications DRGS should be connected to the library because quarterly reports are submitted to DRGS.

"One of the most effective strategies is to tell the academic members of staff who apply for promotion that we want to see your work in the IR; they will deposit the same day." Said participant 1.

Participant 12 stated that "*one of the masters' students from Tanzania came to UNZA after reading my work on the IR. Additionally, I got a consultancy from UNESCO after they saw my*

work on the IR. So members of staff should not allow work to compile before uploading to the IR to increase their visibility."

The IR should be linked to Google Scholar, Research Gate, and academia.edu, and management should encourage members of staff to publish in credible open-source journals.

Another important strategy is offering training and support. We usually have seminars twice a year at the medical school in March and August, so we can have a librarian talk to the members of staff on the importance of the IR and on the importance of publishing."

Participant 15 said that *"we should have strict policies that compels academic members of staff to use the UNZA email address so that when publishing, it's easy to mop publications and upload them to the IR."*

"Currently, it is just the school of Veterinary Medicine that links its academic members of staff to their Google Scholar profiles. If you check on the UNZA website under the school of Veterinary Medicine under staff, you will see that each member of staff is linked to a Google Scholar profile. That way, it is easy for the library to check their Google Scholar profiles and get hold of the missing publications. I suggest that other schools emulate the school of Veterinary Medicine and link their members of staff to their Google Scholar profiles. Said participant 8.

In addition, participant 5 said that offering training is important. *"Offering training to academic members of staff for them to understand the value of depositing their publications in the IR is one strategy that needs to be emphasized. I have been here for over two years now, and I have never had an interaction with the library about the IR."*

4.5 Librarians

4.5.1 Participants' Demographics

Table 4:4 Demographic Characteristics of Librarians

Demographic characteristics of Librarians		**Frequency**
Institutional affiliation of respondents	UNZA	3
	ZCAS	1
	MU	1
	CHAU	1
	LAMU	1
	UNILUS	1
	KNU	1
	CU	1
	CBU	0
	ICU	1
	TAMU	1
Number of Years Had the Institutional repository	1 to 2Years	3
	3 to 4 Years	3
	5 to 6 Years	0
	7 to 8 Years	1
	9 Years and above	5
Number of years managed the Institutional Repository	1 to 2 Years	5
	3 to 4 Years	2
	5 to 6 Years	1
	7 to 8 Years	1
	9 and above	2
Position	Chief Librarian	3
	Senior Librarian	2
	Librarian	4
	Assistant Librarian	3

The study aimed at interviewing 13 Librarians from the HEIs. That is 3 from UNZA and 10 from the other HEIs. However, 12 Librarians were interviewed, which is 95% of the intended number of respondents. The study found that the number of years in which HEIs had the IR varied among the respondents, with 3 having had the IR for 1-2 years, 3 for 3–4 years, 1 for 6-7 years, another 1 for 7-8 years, and 5 for 9 years and above. Three Chief Librarians, two Senior Librarians, four Librarians and three Assistant Librarians were among the respondents.

4.5.2 Institutional Repository Uptake

The study found that 58% (7) of libraries had conducted deliberate trainings to teach academic staff how to use the IR to upload their publications, while the remaining 42% (5) had not conducted such trainings. This was in response to the question of whether the libraries had deliberate training in place to teach academic staff members how to use the IR to upload their publications. Respondents shared various approaches to training, such as departmental sessions, in-house training, and orientation activities. The findings reflect a varied landscape of training practices related to IR in academic libraries.

One respondent stated that "*on request, we have put in place some deliberate trainings on self-archiving; sometimes we go through departments and inform them about these trainings."*

"Yes, we often have trainings with schools. Some schools invite us to train their staff." (Participant 8).

"We do have in-house trainings from time to time; what has delayed is that the IR has been on and off; it has never run smoothly for a full month."

"Last week I was training two lecturers at UNZA. We have about 14 academic librarians who are focal points in the schools. These are the people who inform lecturers that they can get in touch with the library." (Participant 10).

"Ideally, training is supposed to be done as needs arise. There is a deliberate policy to schedule these trainings once a quarter. There are also personalized trainings done when the academic members request." (Participant 6).

"*We oriented the members of staff on the importance of the IR and how they can submit their publications to the email. We also wrote to the department informing them how to submit their publications to the repository, though it wasn't necessarily a training."* (Participant 13).

"We have not yet trained the members of staff. We oriented the deans and the heads of departments during the installation process of the IR."

"No training has been done with regards to the IR." (Participant 9).

When inquired about whether librarians receive requests from academic staff or researchers to add their publications to the IR, the findings revealed that 50% (6) of the respondents reported

not receiving such requests, while the remaining 50% (6) stated that they do receive such requests.

“Yes, last week, one academic staff member came to the library. He had submitted his paper through the email, and he came through to confirm that we had uploaded it to the IR. Some lecturers do appreciate the IR, and they come through. Except that there are not so many, those that are actively writing do come through to the library whenever they have published a new paper.” (Participant 3)

"Yes, we have a lot, but that has been minimized because we teach them how to self-archive, because even we are overwhelmed with work." (Participant 10).

“*No, they don’t come through."* (Participant 8)

“None have come fourth so far; I think the drawback is that the IR has been down." Participant 2).

When asked how frequently academic staff request to have their publications uploaded to the IR, the results showed that 50% (6) of academic staff do not often make such requests, while 25% (3) indicated that the requests are not made frequently, and the remaining 25% (3) stated that the requests are made frequently.

"Not *very often; maybe those who really want to increase their H-index.”*

“They don’t come through." (Participant 10).

"They request for their publications to be added to the IR very often." (Participant 12)

4.5.3 Uploading Legacy Content

When asked about the most convenient way for academic staff and researchers to provide missing information for the librarians to help them upload it to the IR, the study revealed that they should provide metadata in advance, submit the missing publications through emails, and share their Google Scholar profiles with the librarians. Additionally, the study found that submitting CDs is not ideal due to potential challenges in accessing CD-ROMs. Respondents suggested that approaching staff personally, obtaining permission to upload their works, and providing links for the librarians to follow up would be helpful. They also emphasized the importance of complete metadata for the discoverability of uploaded material.

"As a library, we need to approach the members of staff personally; we need to make deliberate efforts. Yes, it would be very helpful if they submitted their Meta data on what they have published."(Participant 6).

"If they can provide us with the links, then the librarians can follow it up. At times, it's a challenge because the academic staff haven't given us permission to upload their works. (Participant 11).

"They can submit through our emails and give us their Google Scholar profiles with the library so that we can follow up and check for the missing publications." (Participant 5).

"They should provide the metadata in advance so that even as they send their work, we already have the metadata." (Participant 10).

"The way I know the researchers, creating metadata of their work and bringing it to me, will take time. And for them to submit a CD, it will be like conducting research all together. I think librarians can come in and collect this information from the academic staff and submit it. Librarians can check their Google Scholar profiles, check which information is missing, and add it to the IR." (Participant 3).

"Submitting the meta data. Submitting CDs is not ideal because machines that can read CDs may be a challenge because the CD ROMs are getting overwhelmed." (Participant 12).

Overall, the findings underscored the need for collaborative efforts between academic staff, researchers, and librarians to ensure effective content management and dissemination through the IR.

When asked what strategies could be used to guarantee that the legacy content or missing publications on the IR are uploaded, the majority of respondents indicated that providing academic staff members with training and support about the IR and its benefits. Implementing clear IR deposit policies that specify how to deposit content and that compel academic members of staff to submit their publications was the next most popular response. The findings also showed that automating the deposit process by integrating the IR with other systems.

"I can say that it's a two-ford situation; on the part of the library, we need to ensure that members of staff appreciate the need to submit their publications in order to make their work

more visible. We need to train the staff on how to upload their content to the IR. The HEIs research policy should have a section that compels members of staff to submit their publications to the library, because sometimes members of staff take time to embrace change. For academic staff to be promoted, research plays a major role, so the IR helps them to be visible. They will be visiting us if they are compelled to." (Participant 4).

"As a librarian, you can download and upload; for example, at UNZA, if they are still working for the university, our policy mandates us to collect anything that we find published by our members of staff, and you need to ensure that you stick to the copyright issues that govern the IR." (Participant 12).

"We need to have an IR policy that will compel members of staff to deposit their publications in the IR." (Participant 15). "Coming up with a clear and straight-forward policy.

"Automating the deposit process and integrating it with other databases will encourage members of staff to deposit the publications with the IR." (Participant 7).

"The university needs an embedded librarian who will be responsible for each school, who will interact with the school, and who will be able to identify such disparities. Sometimes academic staff are even too busy to attend trainings organized by the library. Probably their interest is just in publishing." (Participant 10).

"This is the time for librarians to show their relevance by training the academic staff on the IR. At UNZA, we have the ranking committee, and we have this information, and we can help sensitize the academic staff to submit their publications because that in turn helps us in the ranking of the university." (Participant 2).

"The library is disadvantaged because the members of staff who are in charge of uploading content are few. We have backloads because of insufficient manpower; currently, there is one person at UNZA doing the work when there are supposed to be four people." (Participant 13).

4.5.4 Self-archiving Strategies

When asked what librarians would suggest be done to motivate academic members of staff and researchers to self-archive, the findings revealed that offering training to academic staff was necessary for them to understand the importance of the IR, as was implementing IR policies that

mandate the academic staff to submit their publications. Providing publishing incentives to members of staff who publish and linking the IR to the promotion system. Simplifying the submitting procedure, appreciating academic members of staff who publish through the IR, and streamlining the self-archiving process.

*"In my opinion, most academic staff do not have knowledge about the IR, so there is a need to train academic members of staff on the benefits of the IR." (*Participant 2).

"*Deliberate policies need to be put in place to encourage members of staff to publish through the IR." (Participant 5).*

"Providing publishing incentives to members of staff who submit their publications.

"Offering training and explaining the advantages of submitting publications and conference papers to the IR. Coming up with an IR policy." (Participant 7).

*"Through automation of the deposit process and the implementation of clear IR policies, providing incentives for publishing to members of staff who are publishing. When the work is appearing on the IR, it's being indexed, which improves the H-index. (*Participant 10).

"Linking the promotion system to the IR. The submission process should be simplified. Recognition for members of staff that publish with the IR and simplifying the self-archiving procedure".

"Like I mentioned, one of the ways of motivating the members of staff is through management, especially in line with promotion, if they know that submitting their publications will eventually lead to promotion or if it will improve their visibility." (Participant 3).

When asked which tools or resources would help with self-archiving, the results showed that all the respondents were not aware of tools or resources that would assist with self-archiving.

"I am not a preview of such tools; apart from the email, for example, RemoteX has an embedded Google Scholar in it, which makes it easy." (Participant 5).

"No, I don't know any tools; I have not taken a keen interest in that."

"I am not aware of such a system." (Participant 10).

4.6 Summary

In summary, the study delved into various aspects related to the HEIs focusing on academic staff members' awareness, challenges in self-archiving, strategies for uploading missing publications, and librarians' roles in facilitating IR usage. Key findings include:

- A significant number of academic staff members were unaware of the IR and the challenges associated with self-archiving.
- Participants expressed readiness to provide missing publications through emails, share Google Scholar profiles, and submit metadata in advance for easy uploading to the IR.
- The study highlighted the importance of complete metadata for discoverability and emphasized the need for proactive measures in facilitating the submission of missing publications.
- Librarians play a crucial role in encouraging academic staff to deposit publications in the IR through training, policy implementation, and streamlining the self-archiving process.
- Suggestions included linking the IR to Google Scholar, providing incentives for publishing through the IR, and simplifying the submission procedure to motivate academic staff to self-archive.

Overall, the study underscored the importance of raising awareness, providing support, and implementing effective strategies to enhance the utilization of the IR and improve the visibility of academic publications in HEIs.

CHAPTER 5

DISCUSSION AND RESEARCH FINDINGS

5.1 Overview

This chapter discusses the findings of the study presented in Chapter 4, based on the objectives of the study and the research questions. The study identified effective approaches for improving the uptake of IR content in the HEIs in Zambia. The specific objectives of the study were: determining the IR content status in HEIs in Zambia; identifying effective techniques for depositing legacy content; and self-achieving approaches.

5.2 Institution Repository Publications Uptake

The research findings on IR publication uptake status in HEIs revealed the presence of academic staff members and researchers with Google Scholar profiles from 11 HEIs in Zambia. The UNZA has the highest number of academic staff members, with 661 Google Scholar profiles. This may indicate that UNZA has a larger research community or that its members are more inclined or encouraged to create Google Scholar profiles. CBU follows with 134 academic staff, which is considerably lower than UNZA but still represents a significant number of academic staff with Google Scholar profiles. The other HEIs have a varied number of academic staff on Google Scholar.

These findings are significant as they indicate the research footprint and online visibility of scholarly output in Zambian HEIs. The presence of academic members of staff with Google Scholar profiles suggests a potential for the availability of research output that can be deposited into IRs, contributing to increased online visibility of scholarly research output in Zambia. According to Sale and Couture (2009), the presence of academic staff with Google Scholar profiles is indicative of a strong research culture and potential for increased online visibility of scholarly output.

Having a Google Scholar profile can enhance the visibility of academic work, facilitate collaboration, and aid in tracking citations. HEIs with more staff members on Google Scholar may be perceived as having a more active research community or a stronger emphasis on academic visibility. Additionally, the presence of academic staff on Google Scholar can serve as

an indirect indicator of the institution's research culture, funding opportunities, or the emphasis placed on the publication and dissemination of research findings.

Furthermore, the study extracted publications from the HEIs to assess the content status in these HEIs and to compare the number of publications on Google Scholar with the number of publications that had been ingested on the IRs of the HEIs. Out of the 11 HEIs, publications were extracted from eight IRs, which implies that IRs are operational and actively storing publications in these eight HEIs. However, it's concerning that the IRs of three HEIs, CUB, KNU, and TAU, were down or inaccessible at the time of data collection. This could hinder the accessibility and dissemination of research outputs from these HEIs.

Table 4.1 in Chapter 4 provides a comprehensive overview of the total number of publications available on Google Scholar for each HEI, along with the number of these publications present in their respective IRs. For instance, UNZA has a total of 15,027 publications on Google Scholar, out of which 1,418 (9.5%) are available in its IR, indicating that 91% of the publications available on Google Scholar are missing on the UNZA IR. Similarly, UNILUS has 400 publications on Google Scholar, out of which only 2 (0.5%) are available on Google Scholar, implying that 99.5% of the available publications on Google Scholar are missing on the UNILUS IR. The table continues to show the publication distribution for ZCAS, MU, LAMU, ICU, CHAU, and CU. 359 publications of ZCAS are available on Google Scholar; of these, 124 (35%) are accessible through the IR, meaning that 65% of these publications are missing in the IR.

Additionally, there are 738 publications from MU on Google Scholar; of them, 31 (4.2%) are available on the IR; this means that 96% of the papers that are available on Google Scholar are not available on the MU IR. There are 151 publications from LAMU on Google Scholar; 40 (26%) of these are accessible through the IR, meaning that 74% of the papers that are available on Google Scholar are not available on LAMU IR. Out of the 14 papers that ICU has on Google Scholar, 2 (14%) are available on the IR, meaning that 86% of the publications that are published on Google Scholar are not available on the ICU IR. There are 106 papers from CHAU on Google Scholar; 18 (17%) of them are accessible through the IR, meaning that 83% of the publications are available on Google. 3 of the 167 papers from CU that are available on Google Scholar are also available on the IR, implying that 98% of the publications that are available on Google Scholar are not available on the CU IR.

The findings reveal disparities in the availability of publications between Google Scholar and IRs at various HEIs. The difference between the total number of publications on Google Scholar and the number of publications available in IR across HEIs suggests that Zambian HEIs have different levels of involvement, awareness, or focus on maintaining and populating IRs. This could also be because some of these HEIs are focused on teaching rather than research. These findings are similar to the study by Cullen and Chawner (2011) who found that institutions with a greater emphasis on teaching rather than research may have lower levels of IR adoption and content contribution by academic staff.

HEIs with a higher percentage of their publications in IRs might have more robust IR policies, mandates, or incentives encouraging researchers to deposit their work in the IR. The large gap between Google Scholar publications and IR holdings, especially in HEIs like UNILUS, ZCAS, and CU, emphasises the importance of addressing barriers or challenges that may be preventing researchers from depositing their publications in the IRs. Xia (2008) highlighted that the success of IRs is influenced by factors such as institutional culture, policies, and the level of support from academic staff, which can contribute to the observed disparities.

The findings emphasise the importance of IRs and the visibility of research outputs. Establishing and maintaining functional IRs can enhance the visibility and accessibility of research, ultimately contributing to the reputation and success of academic work in HEIs. The findings also suggest that the availability of publications in IRs may impact the perception of an institution's research culture, funding opportunities, and emphasis on the dissemination of research findings. Therefore, ensuring the accessibility of research outputs through IRs is crucial for portraying an active research community and emphasising academic visibility.

The annual trend and uptake of IRs in HEIs have shown fluctuating patterns over the years. Several HEIs, such as UNZA, ZCAS, LAMU, MU, CHAU, UNLUS, ICU, and CU, have experienced varying trends in IR uptake, as depicted in the respective figures. At UNZA, the IR uptake exhibited a fluctuating trend, starting at 4% in 2010, increasing to 88% in 2013, and then gradually decreasing to 6% in 2023, with fluctuations in between.

Similarly, ZCAS experienced a fluctuating trend, with IR uptake increasing from 40% in 2014 to 67% in 2016, then decreasing to 18% in 2019, and increasing again to 50% in 2023, as shown in figure 5. LAMU also demonstrated a fluctuating trend, with IR uptake varying from over 100%

in 2008 to 0% in 2011, and then fluctuating between 42% and 81% in subsequent years, as shown in Figure 7. The fluctuating trends in IR uptake may highlight the need for further efforts to promote the benefits of IRs and address the concerns of faculty members and researchers regarding content archiving and service quality, which may help in achieving a more consistent and increasing trend in IR uptake over time.

The findings from the data presented in the figures in Chapter 4 indicate varying levels of IR uptake among academic staff and researchers in different HEIs. The studies reveal that IR uptake rates are generally low, with fluctuating trends over the years. At the UNZA, the average IR uptake rate is very low, at 11% based on the individual uptake mentioned in Figure 4.

Similarly, the average IR uptake rate for researchers and academic staff at ZCAS is 37%, as indicated in Figure 6. UNILUS and CU also exhibit low average IR uptake rates of 0.8% and 6%, respectively. These findings suggest that IR uptake rates are not consistently high across these HEIs.

The fluctuating trends in IR uptake are also evident in the data in Chapter 4. For instance, at UNZA, the IR uptake started at 4% in 2010, increased to 88% in 2013, and then gradually decreased to 6% in 2023, with fluctuations in between.

A similar fluctuating trend is observed at ZCAS, where the IR uptake increased from 40% in 2014 to 67% in 2016, then decreased to 18% in 2019, and increased again to 50% in 2023.

These fluctuations indicate that IR uptake rates have not shown a consistent increase over time and have varied significantly. The expectation is that when you deploy the IR, it will result in a gradual increase in uptake because more and more people are going to be using it.

The low and fluctuating IR uptake rates observed in these studies are consistent with findings from other research. For example, a study on the usability of IRs by faculty and postgraduate students at the University of Eswatini (UNISWA) found that poor service quality and fear of archiving scholarly content were cited as reasons for the poor usage of the IR (Saulus and Mutula, 2017).

Similarly, a study on IR awareness and willingness of faculty staff in Nigerian universities revealed varying levels of awareness and willingness to deposit research publications in IRs

(Omeluzor, 2014). These findings suggest that factors such as service quality, technology acceptance, and awareness may influence the uptake of IRs in HEIs.

5.3 Strategies for Uploading Legacy Content

The research findings indicate a wide range of publication outputs across different schools and institutions. For instance, the School of Education and the School of Humanities and Social Sciences at UNZA reported 35 and 40 publications per quarter, respectively, representing the highest outputs within UNZA. In contrast, other schools, like the School of Mines, had a substantially lower output of 5 publications per quarter.

MU reported the most publications among other HEIs, with about 40 per quarter, followed by ICU University with 25, Cavendish University, LAMU, and UNILUS, with each reporting 20 publications per quarter.

The disparities in publication output across schools and institutions may be influenced by various factors such as faculty size, research funding availability, institutional priorities, collaboration networks, and disciplinary differences (Bornman, and Mutz, 2015).

Schools or faculties with higher publication outputs may have stronger research cultures, better infrastructure, increased funding opportunities, or collaborative partnerships that foster research productivity (Kwiek, 2018).

Understanding the average number of publications per quarter provides insights into the research productivity and areas of focus within different schools, faculties, and institutions. Schools or faculties with lower publication outputs might consider implementing strategies to enhance research capacity, foster interdisciplinary collaborations, provide training and resources, or establish partnerships to stimulate research productivity and visibility (Wagner, 2008).

Recognizing the schools and faculties with higher publication outputs can help identify best practices, strategies, or initiatives that contribute to their research success, which could be disseminated or replicated across other departments or institutions.

The research findings on the compilation of quarterly reports revealed that all 16 respondents were engaged in the preparation of quarterly reports within their respective roles or institutions. Among the respondents, there was a split in experiences regarding the ease of compiling

quarterly reports. With 10 (63%) finding it easy to generate the reports and 6 (37%) finding it difficult, those who found it easy attributed their success to receiving reports from heads of departments on time, benchmarking, and funding for publishing. On the other hand, those who found it difficult cited reasons such as staff busyness, delays in submitting information, and the lack of an automated system to track research output. These findings provide information on research productivity in different fields, such as the 2018 research productivity of the UNZA (Chitumbo, 2022), which revealed an overall staff-to-paper publication ratio of 0.6 and 0.8 degrees of collaboration among researchers.

The research findings on the missing publications in IRs revealed that many academic staff and researchers had more publications on their Google Scholar profiles than what had been uploaded to the IRs in their respective schools and faculties. When asked how the missing publications could be captured, the findings demonstrated the necessity of educating academic staff members about the IRs, linking the IR to Google Scholar, and integrating it with the academic promotion tool. Additionally, the respondents suggested that librarians should visit the respective schools to sensitise the staff about the benefits and importance of the IR. They also highlighted the need for an automated system to ensure that every publication with the university email domain is captured.

This discrepancy highlights potential challenges, oversights, or gaps in the dissemination, collection, and archiving of research outputs within institutional frameworks.

Respondents emphasised several strategies and interventions to ensure the missing publications are uploaded to the IRs through educational initiatives: enhancing awareness, understanding, and appreciation of IRs among academic staff through sensitization, training, workshops, and communication campaigns to foster engagement, compliance, and contributions to repositories. Linking IRs to Google Scholar can also make it easier for publications to be automatically extracted, synchronised, or integrated. This makes sure that all research outputs in HEIs are fully covered, visible, and accessible.

Using DRGS's already-built infrastructure, processes, and partnerships, like shared platforms, performance reviews, and IRs, can make it easier to collect, share, and integrate data, which can improve accuracy, efficiency, and usefulness (Lynch, 2003). Using automated systems, technologies, or platforms in IRs can make it easier to collect, archive, and share research

outputs in a way that is seamless, timely, and complete. This can improve visibility, accessibility, and impact.

Respondents highlighted the perceived value, benefits, and motivations for academic staff members to upload publications to Google Scholar, including metrics such as h-index, citations, recognition, and promotion considerations. Recognising and addressing these motivations, incentives, and priorities can inform strategies, interventions, and support mechanisms to enhance engagement, compliance, and contributions to IRs (Swan & Brown, 2028).

The research about who is responsible for making sure that publications included in quarterly reports are uploaded to IRs showed that most of the people who answered 62% thought that librarians were the main people who were responsible for making sure that publications included in quarterly reports were uploaded to IRs. 25% of respondents pinpointed the Directorate of Research and Graduate Studies (DRGS) as responsible for this task. 13% of respondents indicated that Assistant Deans of Research and Heads of Departments (HODs) bear this responsibility.

Respondents highlighted diverse perspectives, experiences, and challenges related to roles, responsibilities, and coordination mechanisms for uploading publications to the IR. With increasing centralization within departments and academic units, roles, responsibilities, and expectations regarding the uploading of publications to the institutional repository may evolve, necessitating clarity, communication, and collaboration among stakeholders (Moghaddasi & Abrizah, 2015).

Additionally, enhancing collaboration, communication, and coordination between libraries, DRGS, Assistant Deans of Research, HODs, and other relevant entities can streamline processes, foster engagement, and optimise the collection, dissemination, and archiving of research outputs in the schools and faculties (Kyrillidou & Young, 2014).

Furthermore, libraries can play a key role in proactively engaging, collaborating, and establishing formal channels, processes, and partnerships with academic members of staff, departments, DRGS, and other stakeholders to facilitate the seamless, efficient, and effective uploading of publications to institutional repositories (Pinfield, 2014). Establishing clear guidelines, responsibilities, communication channels, and support mechanisms can foster

collaboration, compliance, and contributions from academic staff members, departments, librarians, DRGS, and other stakeholders (Swan, 2012).

When academic staff were asked if they were aware of the IR and their responsibility for uploading publications to it, the results showed that while the majority (10) were aware of the IR and their responsibility to submit content or publications to it, six were unaware of the IR and their responsibility to submit publications to it, and three were aware of the IR but not their responsibility to submit publications to it.

The findings align with other studies that have assessed the awareness and utilization of IRs among academic staff and faculty members. For instance, a study conducted at the University of Nebraska-Lincoln found that some faculty members were unaware of the IR and their responsibility to submit publications to it (Akingbade, 2022). Similarly, a study conducted in Tanzania's universities investigated the awareness of IRs among academic staff, finding that some faculty members were unaware of the IRs and their responsibilities to submit publications to them (Kayungi, Ndenje-Sichalwe, and Manda, 2021).

These studies collectively support the findings of the research, indicating that there is a need for increased awareness and understanding of institutional repositories among academic staff members, as well as their roles and responsibilities in submitting content to these repositories.

The study found that 26% of academic staff members were not aware of the IR and their responsibility to submit publications to it. However, 21% of the respondents who were previously unaware expressed their intention to submit their missing publications to the repository. The library's previous claim that there was no space on Dspace, on the other hand, discouraged 21% of the respondents, while 16% thought the submission process was time-consuming and thought the library should be in charge of looking for and uploading the missing publications to the IR. While the other 16% of the respondents submitted their publications to the IR.

Similar studies have explored the awareness and willingness of academic staff to deposit their research publications in IRs. For instance, a study on the awareness and willingness of faculty staff in Nigerian universities to deposit their pre- and post-research publications in open-access IRs highlights the need for prioritising awareness of IRs in HEIs (Omeluzor, 2014).

The respondents also expressed willingness to submit their publications to the IRs once informed and supported. This highlights the potential for successful IR interventions once the following concerns are addressed: increasing awareness of the IR through targeted campaigns and faculty development programmes; clarifying roles and responsibilities regarding publication uploads; simplifying deposit processes using user-friendly interfaces and tools; providing adequate support from librarians and IT staff; and developing collaborative workflows with departments and research units.

The findings from the study indicate that the majority of academic staff members upload their publications to Google Scholar, followed by ResearchGate, Academia.edu, PubMed, and the IRs. Respondents mentioned that Google Scholar is a preferred platform due to its automatic updating and citation metrics. Some respondents also highlighted the visibility and citation benefits of ResearchGate and Academia.edu. However, the IRs were not the primary choice for uploading publications, with some respondents expressing a lack of awareness of the IR and its role in increasing visibility and citations.

Similar studies have addressed the awareness and utilisation of IRs among academic staff. For example, a study on the impact of IRs emphasized the need to prioritise awareness of these platforms in HEIs.

The mention of uploading within departmental journals indicates alternative publication channels exist alongside the IR. Therefore, integrating IR submission with such journals could encourage more submission of content to the IR by the academic members of staff.

Therefore, promoting the IR and its benefits through targeted campaigns, workshops, and integration with research workflows, simplifying the deposit processes for the IR, developing user-friendly platforms, and offering support to faculty facing upload challenges uploading their publications to the IR. Additionally, demonstrating the impact of the IR on the academics of members will motivate them to submit their publications to the IRs and consider integrating IR upload with departmental publication journals and research support units.

The study found that 100% of academic staff respondents had their missing publications readily available, were willing to contact the librarian to share their publications, and were willing to collaborate with the IRs managers. The willingness of the respondent to collaborate with the

library indicates a positive relationship between academic staff and institutional support structures. Collaborations between academic staff and library professionals can significantly increase the ingestion and availability of publications in IRs, as Saleh and Momani (2015) noted. The majority of respondents mentioned that most of their publications are on Google Scholar. This highlights the increasing reliance on digital platforms for academic dissemination. A study by Nicholas et al. (2015) found that academics are becoming more aware of and utilising platforms like Google Scholar, ResearchGate, and IRs to disseminate their work, thus ensuring availability. Therefore, linking the IR to Google Scholar and other databases will increase the visibility of institutional repositories.

The majority of academic staff in the study were found to have their missing publications readily available on their Google Scholar profiles. The emphasis on digital platforms like Google Scholar, Publish or Perish, IRs, and specific journals highlights the evolving landscape of scholarly communication and dissemination. The recurrent mention of Google Scholar highlights its prominence as a widely recognised platform for academics to showcase their publications. According to Moustafa and Ortega (2017), Google Scholar has evolved into a crucial tool for researchers to disseminate their work, thereby increasing visibility and accessibility.

Furthermore, the references to specific institutional platforms like the UNZA promotion scoring tool and the ICU University journal suggest that IRs and platforms play a crucial role in facilitating access to academic publications. According to Saleh and Momani (2015), IRs enhance the visibility and accessibility of academic output, fostering collaboration between academic staff and library professionals.

The academic staff also expressed their willingness to submit soft copies of the missing publications through email and share links to the journals they publish with the librarians so that they can access this information. This finding is similar to a study that found researchers were more likely to deposit their work in IRs if they were aware of the benefits and had a clear understanding of the process (Malekani and Kavishe, 2018).

The research findings highlight several strategies suggested by respondents to ensure that old content missing from the IR is uploaded. These strategies encompass a range of approaches, from training and support to automation, publishing incentives, policy development, and collaboration.

5.3.1 **Training and support**

The majority of respondents emphasised the need for training and support to understand the IR, its benefits, and the upload process. Effective training and support mechanisms are essential for promoting faculty members' use of IRs, as Saleh and Momani (2015) highlight. Librarians can play a pivotal role in conducting workshops, seminars, and one-on-one sessions to educate academic staff about the benefits and procedures of depositing their publications.

5.3.2 **Automation of the Deposit Process**

Automating the deposit process through integration with publication databases or information management systems was a popular suggestion among the respondents. Integrating the IR with other systems, such as publication databases and information management systems, can streamline the deposit process. Automation facilitates seamless uploading of content and reduces the administrative burden on academic staff. Research by Crow and Boock (2012) emphasises the importance of integrating IRs with existing workflows to enhance deposit rates and content coverage.

5.3.3 **Incentives for Publishing**

Providing publishing incentives, such as research grants, travel funding, or recognition points, was suggested as a motivator for faculty engagement. Incentive programs have been implemented in various institutions worldwide, as discussed by Swan and Brown (2008), highlighting their effectiveness in encouraging faculty participation and increasing repository content. In addition, the findings revealed that ZCAS University is offering publication incentives for academic staff; other HEIs can mimic ZCAS University.

5.3.4 **Clear Deposit Policies and Guidelines**

Establishing clear and concise deposit policies that outline the necessary metadata, procedures, and expectations can guide academic staff in submitting their publications to the IR. According to Houghton et al. (2010), well-defined policies and guidelines facilitate consistency, quality control, and compliance with institutional mandates, thereby enhancing the overall effectiveness of IRs.

5.3.5 **Marketing and awareness campaigns**

Promoting the IR and raising awareness about its benefits among academic staff are essential components of encouraging content submission. According to Mbughuni, Mtega, and Malekani (2022), marketing strategies, such as regular communication, targeted outreach, and promotional campaigns, can raise awareness, engagement, and participation in IRs. This can include following up with staff members, sending emails, and scheduling visits to raise awareness about the repository.

5.3.6 **Collaboration**

Collaborative efforts involving librarians, research coordinators, assistant deans, and other stakeholders can facilitate the effective management and promotion of the IR. Collaboration fosters synergies, shared responsibilities, and coordinated efforts to address challenges and capitalise on opportunities.

The above strategies proposed by the respondents emphasise the importance of training, automation, incentives, clear policies, marketing, and collaboration in ensuring the effective management and growth of IRs. By implementing these strategies, HEIs can enhance faculty engagement, increase content coverage, and maximise the impact and visibility of their scholarly output.

The study found that 50% of the respondents reported not receiving requests from academic members of staff or researchers to add their publications to the IR, while the remaining 50% stated that they do receive such requests.

While some respondents reported occasional interactions and requests from proactive staff members interested in increasing their visibility and impact, others highlighted a lack of engagement, awareness, or interest in leveraging the IR for scholarly dissemination and recognition. This observation aligns with the findings of Saleh and Momani (2015), who noted varying levels of awareness, engagement, and participation among faculty members in IR initiatives based on factors such as institutional culture, awareness, incentives, and support mechanisms. These findings are consistent with other studies that have found varying levels of engagement from academic staff members in depositing their publications in IRs. A study on the role of IRs in making lost or hidden cultures accessible found that training sessions were conducted as needs arose and that there were personalized trainings done when the academic

staff requested them (Finlay, 2020). This suggests that the level of engagement from academic staff members in depositing their publications in IRs can vary, and targeted training and support may be necessary to increase participation.

Additionally, respondents emphasized the importance of providing training, guidance, and support to academic staff members on how to self-archive, submit publications, and navigate the IR. Such training initiatives can empower faculty members, enhance their digital literacy skills, and foster a culture of openness, collaboration, and knowledge sharing within the academic community. This perspective resonates with the recommendations of Cox (2013), who underscored the significance of training, capacity building, and engagement initiatives in promoting awareness, adoption, and utilization of IRs among faculty members.

Some respondents attributed the limited engagement and interaction with academic staff members to technical issues, system downtimes, and operational challenges associated with the IR. Addressing these technical constraints, enhancing system reliability, usability, and functionality, and providing responsive, user-friendly interfaces and platforms can facilitate seamless, efficient, and effective interactions, submissions, and access to content within the IR. This perspective aligns with the observations of Swan and Brown (2008), who highlighted the importance of addressing technical, operational, and administrative barriers to foster a supportive and enabling environment for IR development, implementation, and utilisation.

Therefore, to enhance engagement, awareness, and participation among academic staff members, libraries and institutions can adopt proactive, strategic, and targeted promotion, marketing, and outreach initiatives. Leveraging various communication channels, platforms, and strategies, such as workshops, seminars, newsletters, social media, and personalised interactions, can raise awareness, address misconceptions, and foster collaboration, communication, and engagement within the academic community.

The study's findings on the easiest way for academic members of staff to submit missing content to the library revealed that academic staff and researchers should provide metadata in advance, submit missing publications through emails, and share their Google Scholar profiles with the librarians. Additionally, the study found that submitting CDs is not ideal due to potential challenges in accessing CD-ROMs. Respondents suggested that approaching staff personally, obtaining permission to upload their works, and providing links for the librarians to follow up

would be helpful. They also emphasised the importance of complete metadata for the discoverability of uploaded material.

The findings are consistent with the challenges and best practices identified in other publications. For instance, researchers frequently ignore the deposit process, and even when they do deposit their research output in an IR, they frequently do so with insufficient or no metadata (Alter and Neuwith, 2018). This can have an effect on potential students, donors, administrators, and faculty, aside from the risk of failing to meet open research requirements (Alter and Neuwith, 2018). Therefore, the importance of complete metadata for the discoverability of uploaded material is crucial.

Moreover, the study's findings are also in line with the best practices identified in other publications. For instance, the University of Milan has integrated their research information system with the IR, making it mandatory for faculty to upload the metadata from their publications, and full-text is recommended whenever possible. This approach ensures that the metadata is complete and that the full text is available, thus enhancing the discoverability of the research output.

5.4 Self-archiving Strategies

The study found that 58% of libraries had conducted deliberate trainings to teach academic staff how to use the IR to upload their publications, while the remaining 42% had not conducted such trainings. These findings are similar to those of a study on Australian IR staff, which found significant gaps in the current provision of formal training and coursework (Finlay, 2020). Another study at the University of Nebraska at Omaha also discussed the importance of training for repository staff and faculty to introduce them to the IR (Repanovici, 2011).

The study further revealed that the training approaches varied, including departmental sessions, in-house training, orientation activities, and personalised training based on request or as needs arose. Some libraries also conducted trainings with specific schools or departments. These methods align with the findings of a study on digital repository management staff competencies and professional training, which emphasised the need for continuous training and development for IR staff (Repanovici, 2011). Such multifaceted approaches resonate with the findings of Hahn and Jeng (2015), who emphasised the importance of tailoring training programmes to meet the

specific needs, preferences, and contexts of academic staff members to enhance engagement and participation in IR activities.

Some of the training methods mentioned in the study, such as departmental sessions and orientation activities, are also discussed in a study on the role of IRs in making lost or hidden cultures accessible (Malekani and Kavishe, 2018). This study found that training sessions were conducted as needs arose and that personalised training was done when the academic members requested it.

Some respondents expressed concerns about technical issues, inconsistent operation, and resource constraints affecting the effectiveness and continuity of training programs. The findings reflect a diverse landscape of training practices related to IRs in academic libraries, with a mix of proactive and reactive approaches to training. These challenges align with the observations of Cox (2013), who highlighted the importance of addressing technical, operational, and administrative barriers to foster a supportive and enabling environment for IR development, implementation, and utilisation.

A study on challenges or barriers to self-archiving found that 79% of those who responded said they didn't know about either the IRs or the problems that come with self-archiving. The other 21% said it was hard to find time for self-archiving because they were busy and that the process took too long and the submission guidelines weren't clear. Some respondents also stated that they have never self-archived and have not been trained to self-archive.

In response to the question of whether academic members of Staff knew of any tools or resources that would aid in self-archiving, the majority of 16 (84%) said they were unaware of any tools that would aid in self-archiving, while the remaining two (11%) said they were unsure about any such software or tools. The remaining 5% suggested that the IRs be connected to Google Scholar, which would facilitate self-archiving.

The study found that strategies for motivating academic members of staff and researchers to self-archive include offering training to academic members of staff, implementing IR policies that mandate academic members of staff to submit their publications, providing publishing incentives to members of staff who publish, linking the IR to the promotion system, simplifying

the submitting procedure, appreciating academic members of staff who publish through the IR, and streamlining the self-archiving process.

The findings are consistent with previous research on the motivations and barriers to faculty self-archiving in IRs. Another study investigated factors that motivate or impede faculty participation in self-archiving practices, highlighting the placement of research work in various open-access repositories. The study emphasised the benefits of open access and the wide accessibility of research materials (Kim, 2011).

The findings from the study, such as the importance of offering training to academic staff members, implementing IR policies, providing publishing incentives, and simplifying the self-archiving process, are in line with the existing literature on the subject. The study's emphasis on the need for clear policies, incentives, and training aligns with a broader understanding of the factors that influence faculty participation in self-archiving practices.

Academic staff members might be motivated to make their publications available on IRs due to various incentives such as visibility, recognition, and compliance with institutional policies. A study by Tenopir et al. (2011) highlighted that increased visibility and citation impact could motivate researchers to deposit their work in IRs.

The study found that the respondents were not aware of tools or resources that would assist with self-archiving. This finding is consistent with other studies that have found a lack of awareness among academic staff members regarding self-archiving tools and resources.

The search results provided information on various tools and resources that can assist with self-archiving, such as ResearchGate, which is a platform for sharing and discovering research outputs, including self-archived publications (Kim, 2011).

However, there are several tools and resources available that can facilitate the self-archiving process for academic staff and researchers. For instance, Shareyourpaper.org is a tool designed to simplify the self-archiving process, making it easier for authors to legally self-archive and for libraries to fill their repositories. This tool is built on open-source code, community-curated open data, and simple documented APIs, and it is designed to be free and available for anyone to use.

In another study by Chakulya et al., they implemented the self-archiving software tool, which is a web-based application, through the use of MERN STACK technology. The tools are meant to change the monotonous way of interacting with the IR at UNZA, which will in turn reduce or cut down on some of the long processes involved (Chakulya, Chileshe, and Kangwa, 2021). The user-friendly Self-archiving Tool (SAT) will not only improve the way scholars archive their work but also increase the uptake of faculty staff-authored pre-prints and post-prints and Electronic Theses and Dissertations (ETDs) in the IR UNZA.

5.5 Summary

In summary, the key findings from the discussionof the research can be summarized as follows: Institutional Repository (IR) Content Status in Zambian HEIs:

- There are significant disparities between the number of publications academic staff have on Google Scholar versus what is available in their respective institutional repositories.
- The annual trend and uptake of IR publications across various HEIs, such as UNZA, ZCAS, LAMU, MU, CHAU, UNILUS, ICU, and CU, have shown fluctuating patterns over the years, with both increases and decreases in IR uptake observed.
- The majority of academic staff and researchers have a much higher number of publications on Google Scholar compared to what is available in their institutional repositories, with the percentage of publications in the IR ranging from as low as 0.8% (UNILUS) to a maximum of 37% (ZCAS).

Challenges in Populating IRs:

- Many academic staff members were unaware of the IR and their responsibility to submit publications to it.
- Compiling quarterly research reports was challenging for some institutions due to busy schedules of staff, lack of timely submissions, and the absence of an automated system to track research output.
- There was a lack of clarity around whose responsibility it is to ensure publications from quarterly reports are uploaded to the IR, with the majority believing it is the librarians' responsibility.

Strategies for Improving IR Uptake:

- Respondents suggested providing metadata in advance, submitting missing publications via email, and sharing Google Scholar profiles with librarians as convenient ways to capture missing publications in the IR.
- Personally approaching academic staff, obtaining permission to upload their works, and providing links for librarians to follow up were also recommended strategies.
- Emphasizing the importance of complete metadata for the discoverability of uploaded content was highlighted as crucial.

Overall, the findings reveal significant challenges in aligning the scholarly output available on platforms like Google Scholar with the content in institutional repositories, underscoring the need for improved awareness, policies, and streamlined processes to enhance the utilization and visibility of IRs in Zambian HEIs.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

In conclusion, the research findings on the IR publication uptake status in HEIs in Zambia reveal several important insights. The presence of academic staff members and researchers with Google Scholar profiles from 11 HEIs in Zambia indicates the research footprint and online visibility of scholarly output in Zambian HEIs. The presence of academic members of staff with Google Scholar profiles suggests a potential for the availability of research output that can be deposited into IRs, contributing to increased online visibility of scholarly research output in Zambia. However, the findings also highlight the low and fluctuating IR uptake rates among academic staff and researchers in different HEIs. The fluctuating trends in IR uptake observed in the data suggest that IR uptake rates have not shown a consistent increase over time and have varied significantly. The findings also emphasize the importance of IRs and the visibility of research outputs. Establishing and maintaining functional IRs can enhance the visibility and accessibility of research, ultimately contributing to the reputation and success of academic work in HEIs. The research also revealed that some academic staff members were not aware of the IR and their responsibility to submit publications to it, indicating a need for increased awareness and understanding of IRs among academic staff members. The findings collectively underscore the need for further efforts to promote the benefits of IRs and address the concerns of faculty members and researchers regarding content archiving and service quality, which may help in achieving a more consistent and increasing trend in IR uptake over time.

6.2 Recommendations

The findings of the study brought out a number of issues and strategies that would improve the visibility and content of the IRs in the HEIs. These were as follows:

1. HEIs should see to it that their IRs activate the OAI-PMH. This is because, at the time of data extraction from the IRs, only the UNZA IR had the OAI-PMH activated among all the HEIs.

2. The HEIs should embrace the highlighted strategies in the study to ensure that the missing publications are captured and ingested in the IRs. This is due to the fact that there is a huge disparity between the total Google Scholar publications and those available in IR across the. Additionally, the annual IR trend and uptake in the HEIs are very low. This has a great impact on the research visibility and ranking of the HEIs.

3. Based on the research findings, it is recommended that HEIs in Zambia offer training and support to academic members of staff on the IR, highlighting the benefits and importance of depositing their publications in the IR. Effective training and support mechanisms are essential for promoting faculty members' use of IRs. Librarians can play a pivotal role in conducting workshops, seminars, and one-on-one sessions to educate academic staff about the benefits and procedures of depositing their publications. The study found that the majority of the respondents were not aware of the IR, its impact, or the deposit procedures.

4. It is also recommended that the HEIs consider automation of the deposit process by integrating the IRs with other systems, such as publication databases and information management systems, in order to streamline the deposit process. Additionally, the academic staff should be encouraged to use institutional emails when publishing so that their publications can be easily indexed by Google Scholar and other information databases.

5. The study is also recommending that the HEIs implement the IR policies, which will guide the academic members of staff and mandate them to submit their publications to the IR. The policies should also clarify the roles of Assistant Deans of Research, Heads

of Departments, Research Coordinators, and the persons responsible for research in HEIs, ensuring that the publications that are reposted in quarterly reports are submitted to the IR.

6. The IR managers should integrate self-arching tools and systems to ensure an easy deposit process.
7. The library should collaborate and partner with departmental administrators and editors to streamline upload processes for departmental journals and internal databases with the IRs.

REFERENCES

Abu, P.B. and Fabunmi, M. (2009) 'The relationship among teacher variables and adult learners' academic performance', *International Journal of African & African-American Studies*, 4(1).

Adam, U.A. and Kaur, K. (2022) 'Institutional repositories in Africa: Regaining direction', *Information Development*, 38(2), pp. 166–178.

Ajzen, I. and Madden, T.J. (1986) 'Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control', *Journal of experimental social psychology*, 22(5), pp. 453–474.

Akakandelwa, A. (2009) 'Author Collaboration and Productivity at the University of Zambia, 2002-2007.', *African Journal of Library, Archives & Information Science*, 19(1).

Akingbade, L. (2022) 'DigitalCommons @ University of Nebraska - Lincoln Lecturers ' Awareness , Perception and Utilization of Institutional Repositories in Two Universities in Nigeria', pp. 12–23.

Alter, A. and Neuwith, E. (2018) 'The Need for a Next-Generation Research Repository', pp. 1–9. Available at: https://www.exlibrisgroup.com/wp-content/uploads/The-Need-for-a-Next-Gen-Research-Repository-Ex-Libris-Nov2018.pdf.

Angela Repanovici (2011) '1 . Study concerning the state-of-art of the universities digital repositories', *Access*, pp. 1–18.

Babbie, E. and Mouton, J. (2001) 'The practice of social research: South African edition', *Cape Town: Oxford University Press Southern Africa* [Preprint].

Bornman, L and Mutz, R. (2015) 'Growth Rates of Modern Science: A Bibliometic Analysis on the Number of Publications and Cited References', *Journal of the Association for Information SCience and Technology*, 66(11), pp. 2215–2222. Available at: https://asistdl.onlinelibrary.wiley.com/doi/epdf/10.1002/asi.23329.

Borrego, Á. (2017) 'Institutional repositories versus ResearchGate: The depositing habits of Spanish researchers', *Learned Publishing*, 30(3), pp. 185–192. doi:10.1002/leap.1099.

Brink, H., Van der Walt, C. and Van Rensburg, G. (2006) *Fundamentals of research methodology for health care professionals*. Juta and Company Ltd.

Callicott, B.B., Scherer, D. and Wesolek, A. (2016) *Making institutional repositories work*, *Making Institutional Repositories Work*. doi:10.1080/1941126x.2016.1167556.

Caroline S. Wagner (2008) *The New Invisible College: Science for Development*. Brookings Institution Press. Available at: https://books.google.co.zm/books?hl=en&lr=&id=yXRSpKxxlawC&oi=fnd&pg=PP1&dq=Wagner,+C.+S.+(2008).+The+new+invisible+college:+Science+for+development.+Brookings+Institution+Press.&ots=xaUwLdtjFD&sig=K76TZgYZNI5SdyOShvItpeopkTE&redir_esc=y#v=onepage&q&f=fal.

Casey, A.M. (2012) 'Does tenure matter? Factors influencing faculty contributions to institutional repositories', *Journal of Librarianship and scholarly communication*, 1(1).

Chakulya, T., Chileshe, E. and Kangwa, S. (2021) 'ICT 4014 CAPSON PROJECT REPORT Effective Tools for Self-Archiving'.

Chilimo, W. (2016) 'Institutional repositories: Awareness and self-archiving practices of academic researchers in selected public universities in Kenya', in *4th CODESRIA conference on electronic publishing, Dakar, Senegal*.

Chisale, A. and Phiri, L. (no date) 'Towards Metadata Completeness in National ETD Portals for Improved Discoverability', pp. 518–529.

Christian, G. (2009) 'Issues and challenges to the development of open access institutional repositories in academic and research institutions in Nigeria', *Available at SSRN 1323387* [Preprint].

Chitumbo, E.M.M. (2022) 'The 2018 Research Productivity of the University of Zambia', 6(1), pp. 37–45.

Creswell, J.W. (2003) 'A framework for design', *Research design: Qualitative, quantitative, and*

mixed methods approaches, pp. 9–11.

Crow, R. (2002) 'The case for institutional repositories: a SPARC position paper'.

Cullen, R. and Chawner, B. (2010) 'Institutional repositories: assessing their value to the academic community', *Performance Measurement and Metrics* [Preprint].

Cullen, R. and Chawner, B. (2008) 'Institutional repositories in New Zealand: comparing institutional strategies for digital preservation and discovery'.

Davis, F.D. (1989) 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS quarterly*, pp. 319–340.

EDiNA (2009) Open Access Repository Junction http://edina.ac.uk/projects/oa-rj/index.html

Eke, H.N. (2011) 'Digitizing resources for University of Nigeria repository: Process and challenges', *Webology*, 8(1), pp. 1–19.

Ezema, I.J. (2013) 'Local contents and the development of open access institutional repositories in Nigeria University libraries: Challenges, strategies and scholarly implications', *Library Hi Tech* [Preprint].

Fernandes, M. and Walter, A. (2022) 'Publication Behavior in Different Fields of Business Administration: From Anecdotal to Empirical Evidence', *Schmalenbach Journal of Business Research*, 74(3), pp. 265–306. doi:10.1007/s41471-022-00137-9.

Finlay, S.C. (2020) 'DigitalCommons @ UNO Staffing and Workflow for Institutional Glicken, M.D. (2003) *Social research: A simple guide*. Pearson College Division.

Hahn, J., & Jeng, W. (2015). Faculty adoption of open access repositories: A multilevel analysis of the literature. *Journal of the American Society for Information Science and Technology, 66*(8), 1647-1663.

Harnad, S. (2001) 'The self-archiving initiative', *Nature*, 410(6832), pp. 1024–1025.

Repositories'.

Hesli, V.L. and Lee, J.M. (2011) 'Faculty Research Productivity: Why Do Some of Our Colleagues Publish More than Others?', *PS: Political Science & Politics*, 44(2), pp. 393–408.

doi:10.1017/s1049096511000242.

Hockx-Yu, H. (2015) 'Ten years of archiving the UK Web', in *10th International Digital Curation Conference*.

Howel, F. and Stuart I. (2009) EM Loader Documentation. https://www.webarchive.org.uk/wayback/archive/20140614105618/http://www.jisc.ac.uk/whatwedo/programmes/reppres/interoperabilitydemos/emloader.aspx

Jones, R.A. (2005) 'Empowerment for digitization: lessons learned from The Making of Modern Michigan', *Library hi tech* [Preprint].

Katayoon, K. and Abrizah, A. (2010) 'Librarians'role As Change Agents For Institutional Repositories: A Case Of Malaysian Academic Libraries', *Malaysian Journal of Library & Information Science*, 15(3), pp. 121–133.

Kayungi, P.N., Ndenje-Sichalwe, E. and Manda, P.A. (2021) 'Academic Staff Awareness of Institutional Repositories (IRs) in Tanzania Universities', *University of Dar es Salaam Library Journal*, 16(1), pp. 67–83.

Kim, J. (2011) 'Motivations of faculty self-archiving in institutional repositories', *The Journal of Kombo, D.K. and Tromp, D.L.A. (2006) 'Proposal and thesis writing: An introduction', Nairobi: Paulines Publications Africa, 5(1), pp. 814–830Academic Librarianship*, 37(3), pp. 246–254.

Kwiek, M. (2018) 'High research productivity in vertically undifferentiated higher education systems: Who are the top performers?', *Scientometrics*, 115(1), pp. 415–462. doi:10.1007/s11192-018-2644-7.

Kyrillidou, M., & Young, S. (2014) 'Evolving roles of academic Librarians in research data services and scholary communication.', *Association of College & Research Libraries* [Preprint].

Lynch, C.A. (2003) 'Institutional repositories: essential infrastructure for scholarship in the digital age', *portal: Libraries and the Academy*, 3(2), pp. 327–336.

Malekani, A.W. and Kavishe, G. (2018) 'The role of Institutional Repositories in making lost or hidden cultures accessible, a study across four African University Libraries', *Library Philosophy and Practice*, p. 1.

Mbughuni, A.S., Mtega, W.P. and Malekani, A.W. (2022) 'Exploring academic staff engagement in depositing locally produced research content in open access institutional repositories in Tanzania', *https://doi.org/10.1177/03400352211069157*, 48(4), pp. 523–537. doi:10.1177/03400352211069157.

Moghaddasi, H., & Abrizah, A. (2015) 'The Role of University Libraries in the Provision of Bibliotherapy Services: A Review. Library Review', *Library Review*, 64(8/9), pp. 578–594.

Mgonzo, W.J. and Yonah, Z.O. (2014) 'A Review of open access publication in Tanzania', *International Journal of Engineering and Computer Science*, 3(9), pp. 8159–8165.

Moustafa, K., Ortega, J. L. (2017). Google Scholar as a new data source for citation analysis. Library & Information Science Research, 39(2), 144-151.

Mohamed Nour, M. (2012) 'An End-to-End Solution for Complex Open Educational Resources'. Available at: http://pubs.cs.uct.ac.za/archive/00000845/.

Muneja, P. (2010) 'A reflection of Tanzania libraries in the digital age: Challenges and prospects', in *A paper presented as a key note address during the annual conference for the T Nunda, I. and Elia, E. (2019) 'Institutional repositories adoption and use in selected Tanzanian higher learning institutions', International Journal of Education and Development using ICT, 15(1).anzania Library Association (TLA) held in February*.

Okiki, O.C., Osedo, O.A. and Okpah, B. (2020) 'Stakeholders Awareness and Willingness to Submit Scholarly Works to Institutional Repository Towards Research Visibility: A Case of University of Lagos'.

Omeluzor, S.U. (2014) 'Institutional Repository (IR) Awareness and Willingness of Faculty Staff to Deposit Research Work: A Study of Faculty Staff in Selected Public and Private University in Nigeria', *OALib*, 01(09), pp. 1–11. doi:10.4236/oalib.1101139.

Phiri, L. (2018a) 'Research Visibility in the Global South : Towards Increased Online Visibility of Scholarly Research Output in Zambia', *Proceedings of the 2nd IEEE International Conference in Information and Communication Technologies (ICICT 2018)* [Preprint]. Available at: http://dspace.unza.zm/handle/123456789/5723.

Phiri, L. (2018b) 'Research Visibility in the Global South: Towards Increased Online Visibility

of Scholarly Research Output in Zambia', in. IEEE International Conference in Information and Communication Technologies.

Phiri, L. (2020) 'Automatic classification of digital objects for improved metadata quality of electronic theses and dissertations in institutional repositories'

Pinfield., S. (2014) 'No TitleA Mandate to Self-Archive: The Role of Open acess institutional repositories.', *Learned Publishing*, 27(3), pp. 194–204.

Saleh, A., & Momani, B. (2015). Perceptions and attitudes of faculty members towards institutional repositories: A case study from the University of Jordan. The Journal of Academic Librarianship, 41(3), 322-329.

Saturday U. Omeluzor (no date) *(PDF) PRIVATE UNIVERSITIES ACADEMIC STAFF' USE OF INSTITUTIONAL REPOSITORY FOR KNOWLEDGE SHARING AND ACCESS*. Available at: https://www.researchgate.net/publication/338913851_PRIVATE_UNIVERSITIES_ACADEMIC_STAFF'_USE_OF_INSTITUTIONAL_REPOSITORY_FOR_KNOWLEDGE_SHARING_AND_ACCESS (Accessed: 12 January 2024).

Saulus, N.R. and Mutula, S. (2017) 'Usability of the Institutional Repository by Faculty and Postgraduate Students at the University of Swaziland'.

Swan, A., S.B. (no date) 'Data_skills_report_final_draft'.

Thompson, D.F. and Nahata, M.C. (2012) 'Pharmaceutical science faculty publication records at research-intensive pharmacy colleges and schools', *American Journal of Pharmaceutical Education*, 76(9), p. 173. doi:10.5688/ajpe769173.

The University of Zambia. UNZA Repository Home." n.d. Accessed March 22, 2021. http://dspace.unza

Appendix A: Information and Consent Form for Assistant Deans Research and persons responsible for Research / Librarians and Academic members of Staff in Higher Education Institutions

University of Zambia

School of Education

Department of Library and Information Science

Title: Identifying Effective Approaches for Improving the Uptake of Institutional Repositories (IRs) Content in the Higher Education Institutions In Zambia

Section A: Information Sheet (for men and women > 18 years old)

My names are Matildah Mercy Muchinga. I am pursuing a Master's Degree in Library and Information Science at the University of Zambia in the School of Education. The purpose of this research is to identify the effective approaches for improving the uptake of IR content in the Higher Education Institutions (HEIs).

Literature has shown that academic members of staff tend to have a lot more publications on Google Scholar than on the institutional repository and this has implications on the ranking of the universities in that there are certain entities that rank university's based on research visibility. Therefore the aim of this study is to identify strategies and approaches that will be used to ensure that content or publications that were previously done by the academic members of staff and researchers which are missing on the repository are uploaded. And to ensure that in the future every time there's a new publication, it is timely and efficiently uploaded to the institutional repository.The research is purely for academic purposes and the information given will therefore be treated with utmost confidentiality. Before you decide on whether you would like to participate in the research; you would be advised, if you may, to speak to anyone you feel comfortable with. In the case that there are some words that you do not understand, please feel free to ask me for clarification.

Purpose of the Research

To identify the effective approaches for improving the uptake of IR content in the Higher Education Institutions (HEIs).

Type of Research Intervention

The research involves participating in a brief interview either virtually or physically at your convenience, which should take between 15 and 20 minutes

Participant selection
You are being invited to take part in this interview because you are responsible for compiling statistics about different publications that have been authored in your Institution, school, faculty, department or directory or you are either; a librarian managing the institutional repository, or you are responsible for uploading or reviewing content to the institutional repository, or because you are knowledgeable about the subject and you are a Librarian from one of the Higher Institutionaland you work in one of the following higher education Institutions. The University of Zambia (UNZA), Copper belt University (CBU), .Lusaka Apex Medical University (LAMU), Cavendish University, Chalimbana University, Texila American University, Kwame Nkrumah University, Mulungushi University, University of Lusaka (UNILUS), Zambia Centre for Accountancy Studies (ZCAS), and or Information and Communication University (ICU).

Voluntary Participation
Your decision to participate in this study is entirely voluntary. It is your choice whether you want to take part or not. If you choose not to consent, nothing will change.
You may also choose to change your mind later and stop participating, even if you had earlier agreed, and still nothing will change.

Procedures
You are invited to participate in a research study by answering an online questionnaire. You have been randomly selected and if you do not wish to answer any questions you may skip them and move to the next question. The information recorded is confidential, your name is not being included on the forms, only a number will identify you, and no one else except the Principal Investigator will have access to the survey.

Risk and discomfort
You do not have to answer any question or take part in the survey if you feel the question(s) are too personal.

Reimbursements
You will not be provided any incentive to take part in research
There may be not any benefit directly now, but allowing your participation will help us find strategies and approaches of ensuring that the missing content and publications are uploaded to the institutional repositories.
.
Confidentiality
This research is purely for academic purposes; your identity will not be publicized as the information that will be provided will be treated with the confidentiality it deserves.

Sharing of Results
The knowledge that will be obtained from this study will be shared with you through your University Libraries. Confidential information will not be shared.

Right to Refuse or Withdraw
You do not have to agree to take part in this research if you do not wish to do so and refusing to will not affect you. You may stop participating in the research at any time that you wish.

Who to Contact
If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, please contact me on:
Matildah Mercy Muchinga, Lusaka. Cell- 0975- 793484. E-mail: muchingamatildah@gmail.com

This proposal or protocol has been reviewed and approved by HSSREC which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find about more about the IRB, contact:

The Chairperson,
Dr. Jason Mwanza,
Humanities and Social Sciences, Research Ethics Committee,
University of Zambia
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LUSAKA

Section B: Certificate of Consent

I have been invited to participate in this research on identify the effective approaches for improving the uptake of IR content in the Higher Education Institutions (HEIs). I have read the foregoing information, or it has been read to me and I have understood it. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I will receive no payment for participating in the study. I know that my participation is anonymous and I have access to the data and records at any time. I know that I can stop my participation in this study at any time. I consent voluntarily to answer the questionnaire.

Print Name of Participant: _____

Signature of Participant: _____

Date_____

Statement by Researcher/Person taking consent

I have accurately read out the information sheet to the potential participant and the best of my ability made sure that the participant understands that the following will be done

1) Interview guide will be administered to them
2) Their answered will be kept as confidential documents

I confirm that the participant was allowed to ask questions about the study and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent and the consent has been given freely and voluntarily.
A copy of the ICF has been given to the participant.

Print Name of the Researcher/ person taking the consent: _____

Signature of Researcher/person taking the consent: _____

Date: _____

Contacts for Questions
Principal Investigator

Names: Matildah Mercy Muchinga
Phone: 0975-793484
Email: muchingamatildah@gmail.c

Appendix B: Interview Guide for Assistant Deans/ Research Coordinators/ Persons responsible for Research in Higher Education Institutions

The University of Zambia

School of Education

Department of Library and Information Science

Interview Guide

Research Title:

Identifying Effective Approaches for Improving the Uptake of Institutional Repositories (IRs) Content in the Higher Education Institutions in Zambia Dear Respondent,

I am pursuing a master of Library and Information Science at the University of Zambia, in the school of Education, undertaking a research entitled "Identifying Effective Approaches for Improving the Uptake of Institutional Repositories (IRs) Content in the Higher Education Institutions in Zambia".

We have noticed that academic members of staff have a lot more publications on Google Scholar than on the institutional repository and this has implications on the ranking of the universities in that there are certain entities that rank university's based on research visibility.

We are therefore, trying to better understand what we can do to fix this problem by identifying strategies and approaches that will be used to ensure that content or publications that were previously done by the academic members of staff and researchers which are missing on the repository are uploaded. And to ensure that in the future every time there's a new publication, it is timely and efficiently uploaded to the repository.

I am therefore inviting you to be part of this research by participating in this interview either virtually or physically which should take between 15 and 20 minutes.

Please be assured that the information you will provide in this interview is purely for academic purposes only and will be treated with the utmost confidentiality. Your participation will be highly appreciated.

Instructions:

The following are the questions which will be asked during the interview

1. Which Institution are you from?
2. What is your position?
3. Which Department and Faculty or School?
4. How many academic members of staff do you have in your school or faculty approximately?
5. On average, how many publications come out of your school, faculty, or Institution?
6. Do you compile monthly or quarterly research reports?
7. How easy is it for you to compile these reports?
8. We have noticed that most of the academic members of staff under your school or faculty have more publications uploaded to google scholar than what has been uploaded on the institutional repositories, how do you think we can get hold of this missing information so that it can be uploaded on the institutional repository?
9. Whose responsibility do you think it is to ensure that these publications that are compiled in reports are uploaded to the Institutional Repository?
10. Are you aware that you can actually use the institutional repository in generating the quarterly reports with regards to what each academic member of staff has published?
11. What strategies do you think we can employ to ensure that;

a) The old publications that have been done by academic members of staff and researchers in the recent past in your school of faculty, but have not been archived in the institutional repository is uploaded?

b) And secondly ensuring that in the future every time there's a new publication, it is timely and efficiently uploaded to the repository?

Options;

5.3.7 Offering trainings and support to academic members of staff for them to understand the value of depositing their publications or content to institutional repositories.

5.3.8 ii. Providing Incentives to academic members of staff who are uploading publications to the institutional repository

5.3.9 iii. Implementing clear institutional repository deposit policies that specify how to deposit content and what metadata is required.

5.3.10 iv. By automating the deposit process through integrating the repository with other systems such as information management systems and publication databases.

5.3.11 Other, explain

THE END

Thank you for taking the time to participate in this interview

Appendix C: Interview Guide for Academic Members of staff and Researchers

The University of Zambia

The University of Zambia

School of Education

Department of Library and Information Science

Interview Guide

Research Title:

Identifying Effective Approaches for Improving the Uptake of Institutional Repositories (IRs) Content in the Higher Education Institutions in Zambia Dear Respondent,

I am pursuing a master of Library and Information Science at the University of Zambia, in the school of Education, undertaking a research entitled "Identifying Effective Approaches for Improving the Uptake of Institutional Repositories (IRs) Content in the Higher Education Institutions in Zambia".

We have noticed that academic members of staff have a lot more publications on Google Scholar than on the institutional repository and this has implications on the ranking of the universities in that there are certain entities that rank university's based on research visibility.

We are therefore, trying to better understand what we can do to fix this problem by identifying strategies and approaches that will be used to ensure that content or publications that were previously done by the academic members of staff and researchers which are missing on the repository are uploaded. And to ensure that in the future every time there's a new publication, it is timely and efficiently uploaded to the repository.

I am therefore inviting you to be part of this research by participating in this interview either virtually or physically which should take between 15 and 20 minutes.

Please be assured that the information you will provide in this interview is purely for academic purposes only and will be treated with the utmost confidentiality. Your participation will be highly appreciated.

Instructions:

The following are the questions which will be asked during the interview

1. Which Institution are you from?
2. What is your position?
3. Which Department and Faculty or School?
4. How Many years have you been working with this institution?
5. How Many publications do you publish in a year?
6. Are you aware about the institutional repository and your role in uploading publications to the IR?
7. Have you noticed any differences in the number of publications that you have uploaded on Google Scholar against what has been uploaded on the institutional repository?
8. Why is it that you are not making the intention to ensure that your publications are uploaded on the institutional repository?
9. Where do you upload your publications or content?
   Options;
   Institutional repository, Google Scholar, Academia.edu, ResearchGate, Other, explain
10. Have you encountered any challenges or barriers to self-archiving your work on the IR?
11. Do you know of any tools or resources to help you with self-archiving?
12. Do you have readily available these missing legacy content that is not ingested on the institutional repository?
13. If yes to Q12 above, would you point to us where we can find your missing publications?
14. What strategies do you think we can employ to ensure that;

a) The old publications that have been done by academic members of staff and researchers in the recent past in your school of faculty, but have not been archived in the institutional repository is uploaded?

b) And secondly ensuring that in the future every time there's a new publication, it is timely and efficiently uploaded to the repository?

Options;

5.3.12 Offering trainings and support to academic members of staff for them to understand the value of depositing their publications or content to institutional repositories.

5.3.13 ii. Providing Incentives to academic members of staff who are uploading publications to the institutional repository

5.3.14 iii. Implementing clear institutional repository deposit policies that specify how to deposit content and what metadata is required.

5.3.15 iv. By automating the deposit process through integrating the repository with other systems such as information management systems and publication databases.

5.3.16 Other, explain

THE END

Thank you for taking the time to participate in this interview

Appendix D: Interview Guide for Librarians and Persons Responsible for Managing Institutional Repositories

The University of Zambia

The University of Zambia

School of Education

Department of Library and Information Science

Interview Guide

Research Title:

Identifying Effective Approaches for Improving the Uptake of Institutional Repositories (IRs) Content in the Higher Education Institutions in Zambia Dear Respondent,

I am pursuing a master of Library and Information Science at the University of Zambia, in the school of Education, undertaking a research entitled "Identifying Effective Approaches for Improving the Uptake of Institutional Repositories (IRs) Content in the Higher Education Institutions in Zambia".

We have noticed that academic members of staff have a lot more publications on Google Scholar than on the institutional repository and this has implications on the ranking of the universities in that there are certain entities that rank university's based on research visibility.

We are therefore, trying to better understand what we can do to fix this problem by identifying strategies and approaches that will be used to ensure that content or publications that were previously done by the academic members of staff and researchers which are missing on the

repository are uploaded. And to ensure that in the future every time there's a new publication, it is timely and efficiently uploaded to the repository.

I am therefore inviting you to be part of this research by participating in this interview either virtually or physically which should take between 15 and 20 minutes.

Please be assured that the information you will provide in this interview is purely for academic purposes only and will be treated with the utmost confidentiality. Your participation will be highly appreciated.

Instructions:

The following are the questions which will be asked during the interviews.

1. Which Institution are you from?
2. What is your position?
3. How long have you had the institutional Repository?
4. How long have you been managing, overseeing or uploading content to the repository?
5. Are there deliberate trainings put in place to train academic members of staff on how to use the institutional repository to upload their publications?
   a) If yes, when last did you train the academic members of staff on self-archiving and using the IR?
   b) If NO, why haven't you considered training the academic members of staff on self-archiving their publications to the IR?
6. 3. If academic members of staff and researchers are not uploading or self-archiving their publications to the repository, what strategies can you employ to ensure that:

   a) The old publications or articles that have been done by academic members of staff and researchers in the recent past in your institution, but have not been uploaded in the institutional repository is uploaded?

7. b) And secondly ensuring that in the future every time there's a new publication, it is timely and efficiently uploaded to the repository? Options;

ii. Offering trainings and support to academic members of staff for them to understand the value of depositing their publications or content to institutional repositories.

ii. Providing Incentives to academic members of staff who are uploading publications to the institutional repository

iii. Implementing clear institutional repository deposit policies that specify how to deposit content and what metadata is required.

iv. By automating the deposit process through integrating the repository with other systems such as information management systems and publication databases.

5.3.17 Other, explain

6 Do you normally have academic members of staff or researchers that normally come to you requesting that you add their publications to the repository? If yes, how often do they come to you?

7 What would be the easiest way of academic members of staff and researchers providing the information that is missing so that you help them upload it to the repository?

Options;

a) Offering trainings and support to academic members of staff for them to understand the value of depositing their publications or content to institutional repositories.

b) By incentivizing deposit by offering rewards or recognition for academic members of staff and researchers deposit their content to the institutional repository,

c) Implementing clear institutional repository deposit policies that specify how to deposit content and what metadata is required.

d) By automating the deposit process through integrating the repository with other systems such as information management systems and publication databases.

8 Do you normally have academic members of staff or researchers that normally come to you requesting that you add their publications to the repository?

b) If yes, how often do they come to you?

9 Do you know of any tools or resources to help you with self-archiving?

THE END

Thank you for taking the time to participate in this interview

Appendix E: Approval of Study

THE UNIVERSITY OF ZAMBIA
DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

Great East Road Campus | P.O. Box 32379 | Lusaka10101 | Tel: +260-211-290 258/291 777 **Fax**: (+260)-211-290 258/253 952 | E-**mail**: director.drgs@unza.zm | Website: www.unza.zm

APPROVAL OF STUDY

IORG No. 0005376
HSSREC IRB No. 00006464

20th March, 2023,

REF NO. HSSREC:-2023 MAR- 025

Ms,Matilda Mercy Muchinga,
IDE,
P.O.BOX, 32379,
LUSAKA.

Dear, Ms. Muchinga,

RE: "IDENTIFYING EFFECTIVE APPROACHES FOR IMPROVING THE UPTAKE OF INSTITUTIONAL REPOSITORIES CONTENT IN THE HIGHER EDUCATIONAL INSTITUTIONS IN ZAMBIA"

Reference is made to your submission of the protocol captioned above. The HSSREC resolved to approve this study and your participation as Principal Investigator for a period of one year.

REVIEW TYPE	**ORDINARY REVIEW**	**APPROVAL NO. HSSREC:-2023- MAR- 025**
Approval and Expiry Date	Approval Date: 14th March, 2023	Expiry Date: 13th March, 2024

Protocol Version and Date	Version - Nil.	13th March, 2024
Information Sheet, Consent Forms and Dates	English.	To be provided
Consent form ID and Date	Version - Nil	To be provided
Recruitment Materials	Nil	Nil
Other Study Documents	Questionnaire.	
Number of Participants Approved for Study		

Specific conditions will apply to this approval. As Principal Investigator it is your responsibility to ensure that the contents of this letter are adhered to. If these are not adhered to, the approval may be suspended. Should the study be suspended, study sponsors and other regulatory authorities will be informed.

CONDITIONS OF APPROVAL

- No participant may be involved in any study procedure prior to the study approval or after the expiration date.

- All unanticipated or Serious Adverse Events (SAEs) must be reported to HSSREC within 5 days.

- All protocol modifications must be approved by HSSREC prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address.

- All protocol deviations must be reported to HSSREC within 5 working days.

- All recruitment materials must be approved by HSSREC prior to being used.

- Principal investigators are responsible for initiating Continuing Review proceedings. HSSREC will only approve a study for a period of 12 months.

- It is the responsibility of the PI to renew his/her ethics approval through a renewal application to HSSREC.

- Where the PI desires to extend the study after expiry of the study period, documents for study extension must be received by HSSREC at least 30 days before the expiry date. This is for the purpose of facilitating the review process. Documents received within 30 days after expiry will be labelled “late submissions” and will incur a penalty fee of K500.00. No study shall be renewed whose documents are submitted for renewal 30 days after expiry of the certificate.

- Every 6 (six) months a progress report form supplied by The University of Zambia Humanities and Social Sciences Research Ethics Committee as an IRB must be filled in and submitted to us. There is a penalty of K500.00 for failure to submit the report.

- When closing a project, the PI is responsible for notifying, in writing or using the Research Ethics and Management Online (REMO), both HSSREC and the National Health Research Authority (NHRA) when ethics certification is no longer required for a project.

- In order to close an approved study, a Closing Report must be submitted in writing or through the REMO system. A Closing Report should be filed when data collection has ended and the study team will no longer be using human participants or animals or secondary data or have any direct or indirect contact with the research participants or animals for the study.

- Filing a closing report (rather than just letting your approval lapse) is important as it assists HSSREC in efficiently tracking and reporting on projects. Note that some funding agencies and sponsors require a notice of closure from the IRB which had approved the study and can only be generated after the Closing Report has been filed.

- A reprint of this letter shall be done at a fee.

- All protocol modifications must be approved by HSSREC by way of an application for an amendment prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address or methodology and methods. Many modifications entail minimal risk adjustments to a protocol and/or consent form and can be made on an Expedited basis (via the IRB Chair). Some examples are: format changes, correcting spelling errors, adding key personnel, minor changes to questionnaires, recruiting and changes, and so forth. Other, more substantive changes, especially those that may alter the risk-benefit ratio, may require Full Board review. In all cases, except where noted above regarding subject safety, any changes to any protocol document or procedure must first be approved by HSSREC before they can be implemented.

Should you have any questions regarding anything indicated in this letter, please do not hesitate to get in touch with us at the above indicated address.

On behalf of HSSREC, we would like to wish you all the success as you carry out your study.

Yours faithfully,

Dr. J.I. Ziwa

DR. J. I. Ziwa

ACTING CHAIRPERSON
THE UNIVERSITY OF ZAMBIA HUMANITIES AND
SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE - IRB

cc: Director, Directorate of Research and Graduate Studies
Assistant Director (Research), Directorate of Research and Graduate Studies
Assistant Registrar (Research), Directorate of Research and Graduate Studies