Re-Imagining Library and Information Services in the Digital Era

Proceedings of the
26th Standing Conference of Eastern, Central and Southern African Library and Information Associations (SCECSAL XXVI) held on 22nd — 26th April 2024 in Mombasa, Kenya

Editors

Tom Kwanya, Irene Muthoni Kibandi, Peter Gatiti

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Library of Congress Cataloging-in-Publication Data

Proceedings of the 26ᵗʰ Standing Conference of Eastern, Central and Southern African
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Acknowledgements

The twenty-sixth edition of the Standing Conference of Eastern, Central, and Southern African Libraries (SCECSAL XXVI) would not have been held successfully without the tireless and selfless contributions of many individuals and organisations. First and foremost, I wish to acknowledge and appreciate the contribution of the following local organising committee members:

- Irene Muthoni Kibandi – Chairperson
- Jacinta Were – Vice Chairperson
- Dr Sarah Kibugi – Treasurer
- James Nyakundi – Secretary
- Prof Constantine Nyamboga
- Prof Tom Kwanya
- Dr Arnold Mwanzu
- Dr Naftal Chweya
- Stephen Mau
- Lilian Momanyi
- Christine Tuitoek
- Alfred Odhiambo
- Mary Kinyanjui
- Evan Njoroge
- Isaac Nyarigoti

I also appreciate the keynote speaker, Prof Clara Chu, for her exciting, inspiring and informative address. Prof Chu also facilitated a workshop on strengthening library leadership for innovative and sustainable institutional development. I also acknowledge Prof Bosire Onyancha who conducted a workshop on the impact of bibliometrics on academic libraries. I also recognise the support of the SCECSAL Secretariat, particularly Dr. Justin Chisenga, in coordinating diverse aspects of the conference.

As the Kenya Library Association, we are forever grateful to the delegates, sponsors, volunteers, and other service providers who contributed in any way to making the conference a success. We hope that the conference experience was memorable and that the networks initiated will be maintained and maximised for the benefit of our profession and user communities, fostering future collaboration and growth.

Prof Peter Gatiti
Chair, Kenya Library Association & Chair SCECSAL Council

PREFACE

The information universe, within which libraries currently operate and offer services, is not just dynamic and volatile, but also brimming with transformative potential. Rapid technological advancement, technology-savvy and impatient patrons, vast volumes of information, and increasing pressure on libraries to demonstrate return on investment are some factors catalysing this change. Information professionals have been pushed back to the drawing board. To remain relevant, they must re-imagine the substance and delivery of information services and products. The digital era offers diverse opportunities and channels for tailored, proactive and prompt information products and services. How well information professionals harness these opportunities depends on their creativity.

This publication is a comprehensive resource, a collection of 36 creative cases that provide invaluable insights on how to deliver information products and services in the digital era. Each of the 37 papers in these proceedings is a treasure trove of knowledge, discussing issues crucial to mastering the ropes of service design and delivery in the digital information era. The papers are grouped into seven categories and sections, providing a structured and comprehensive approach to the topic.

The papers on the best practices in the records and information management category present invaluable insights on redesigning organisational records and archives through emerging information and communication technology tools and techniques. These technologies facilitate the strategic collection, classification, preservation and dissemination of organisational records and national archives. This transformation turns records and archives from costly to valuable assets for operational and strategic endeavours, underscoring the potential benefits of adopting new technologies and techniques.

Information workers have always been the bridges between information and its users. Their role has been crucial in identifying, collecting, organising, and disseminating materials for users who visited the information centres. However, the situation has evolved, and so have their roles. The focus of the information centres has shifted from collections to connections, and information professionals are at the forefront of this change. The second set of papers in this publication elaborates on the changing and increasingly important roles that library and information sciences professionals have to shoulder in this digital era, making them feel valued and integral to the industry.

Information is power and should be handled with utmost care. Ethical, legal, and moral guidelines regulate information production, organisation, dissemination, and preservation. As information users become more aware of their rights, information professionals and service providers need to stay abreast of their obligations. The papers on information ethics share ideas on how to avoid ethical, legal, and moral conflicts in information service design and delivery.

Research is the source of new ideas and innovations driving socioeconomic development. Available evidence shows that many people currently do not begin or complete their information-seeking with libraries. Therefore, it is incumbent on libraries and information centres to reposition themselves in the core of the information universe as sources of credible research data. Skills and competencies to contribute and manage research data are essential for contemporary information professions. Papers in this collection highlight essential research insights for the progressive information worker.

There are papers on education and training programmes and approaches that build the digital-era capacities of information workers to conceptualise, develop, and deliver responsive and futuristic information services and products in this age and into the future using both conventional and technological platforms.

All the papers were peer-reviewed using a double-blind approach. The editors have made all efforts to ensure that the papers are of the highest scholarly standard possible. However, we apologise for any errors which may have escaped undetected. We wish you an insightful reading.

Tom Kwanya, Irene Muthoni Kibandi, Peter Gatiti
Editors

BEST PRACTICES IN RECORDS AND INFORMATION MANAGEMENT

1. Records Management Practices and Service Delivery: A Case of Academic Registrar's Department at the All-Saints University Lango

Kenneth Abong*; David Luyombya**

**Aga Khan University Uganda*
kennethblisxz@gmail.com

**Makerere University
dluyombya@cis.mak.ac

Abstract

The delivery of services in an academic department relies on its ability to manage records through good records management practices. This study was carried out to examine the records management practices in the Academic Registrar's Department (ARD) of All Saints University Lango (ASUL) and how they impact service delivery. The objectives were to examine the types of records kept, records management practices, and the associated challenges and recommend strategies for improvement. The study used a case study design with a qualitative approach that was employed in the study. Purposive and convenient sampling was carried out on the study participants. Data was collected from 13 respondents, including three registrars, two records staff, two secretaries, one IT support team, and five students. This was done through interviews, participant and direct observation, and document analysis. The study found that ARD generated various records, including academic results, programs, reports, and individual student files. The study found that the records storage conditions were poor, and records files were packed and retained on the office table and the floor. Records staff, Secretaries, and Registrars managing academic records had limited records management knowledge and skills, which affected service delivery. The study recommended that ASUL employ professional records management staff to manage academic records and train all ARO staff on records management practices to ensure effective service delivery.

Keywords: *Records management, academic records, ephemeral value, records continuum, recordkeeping*

1 Introduction

The day-to-day operations of any successful university depend entirely on its records management practices (Simwaka, 2022). As academic departments provide services, records continue to grow, and therefore, academic departments need consistent and coherent record management practices and procedures to successfully manage records throughout their lifecycle (Simwaka, 2022). Records management practices include the processes of systematically managing records, including identifying, classifying, filing, storing, archiving, and controlling the destruction of records (Tadaferua & Omehia, 2022).

Effective management practices make records easy to access and retrieve (Touray, 2021). Easy to track and protect from unauthorised alteration and deletion (Muhammad et al., 2021; Touray, 2021). Accurate and proper records in the academic registrar's department can be kept appropriately (Dano & Ibrahim, 2021; Ifenaike & Olatokun, 2021). Ineffective records management practices lead to inefficient staff time and poor decision-making due to failure to access the right records (Allison, 2021). Misplacement of files and loss of records in academic departments (Falolo et al., 2022). A required record will not be easily retrieved if the practices are ignored, and searching for a particular record will also take much time (Barigye et al., 2022). Such a condition has a great potential to hamper service delivery in a university and compromise the attainment of transparency and good governance (Musembe, 2016).

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Scholars such as (Allison, 2021; Mwanyungu, 2019; Otieno, 2021; Sanwine, 2020; and Shonhe & Grand, 2018) all agreed that records management enhances service delivery in academic institutions. They discovered that the services provided by academic departments included the admission of new students, conducting examinations, verifying student results, maintaining archive academic reports, preparing and issuing transcripts, preserving students' registration forms, providing class schedules and timetables, filing and maintaining academic records (Allison, 2021; Sanwine, 2020).

The ASUL academic registrar's department generates records as students are admitted, during continuous registration, and as transcripts are issued. However, records are difficult to access when needed by the students and staff (All Saints University Lango, 2020a). The report further indicated that information relating to different activities carried out in the ARD was not produced on time, there were no proper and adequate ways to keep the incoming and outgoing records and heaps of unfiled records are a common site in all offices at ASUL. Against this background, this study was carried out to examine the records management practices at the Academic Registrar's Department.

2 Theoretical framework

A theoretical framework is a foundational review of existing theories as a roadmap for developing arguments for research work (Calder et al., 2023). The records life cycle theory and the records continuum guided this study. These theories are brought together under an integrated recordkeeping framework with the same goal to guarantee the reliability, authenticity, and completeness of records regardless of format (Matlala & Maphoto, 2020). The purpose of using the two approaches is to provide a common understanding, consistent standard unified best practice criteria, and interdisciplinary approaches to recordkeeping and archiving processes for both paper and digital records (Evans et al., 2017; Frings-Hessami, 2022).

The basic concept of this life theory is that every record progresses through three phases: a record is created, is used and maintained, and is dispositioned (either by destruction as a record of ephemeral value or by transfer to national archives as a record of enduring value) (Tadaferua & Omehia, 2022). Meanwhile, the continuum concept ensures a consistent and coherent process of record management throughout the life of records, from the development of recordkeeping systems through the creation and preservation of records to their retention and use as archives (Evans et al., 2017).

With the prevalent of paper records in academic institutions, as reported by previous researchers (Adu, 2014; Otieno, 2021; Sanwine, 2020), the records life cycle alone would only give the essential guide to the management of records, but the Records Continuum was also helpful to analyse the records that existed in the electronic format.

Records creation and receipt is the initial step in records management (Ameyaw & Frempong-Kore, 2020). Academic records are created as students fill in their forms, i.e., biodata forms, communicate via emails, and through registration, for example, in exams, class attendance, and so forth (Adu, 2014; Musembe, 2016). They are also received from internal and external sources and identified, such as memos, correspondences, emails, students' admission letters, examination results, and transcripts, among others (Sanwine, 2020). Records are captured into an appropriate recordkeeping system after creation to be readily available for retrieval and use (Otieno, 2021).

Filing and indexing is the second step in managing academic records (Allison, 2021). This involves having a records file plan and procedures to enhance the filing practice. A file plan specifies how records are to be organised and managed, for example, allocating file reference numbers, retention periods, and other instructions for managing the records (Allison & Otuza, 2017). Records-filing procedures require first checking whether the appropriate file on which the record is supposed to be placed exists (Sanwine, 2020).

If it does not exist, a new file is created and titled accordingly; then a folio reference number is assigned to each record to differentiate it from other records on the file (Wilkins, 2021).

Filing may be organised centrally, whereby all the files of an institution are kept and controlled in one room (Allison, 2021). Meanwhile, an institution may adopt a decentralised file storage system where the records are stored in many locations, and each department files its record (Adu, 2014). This is also known as categorising, classifying, or unitising records (Dasmani, 2019). Classification schemes and file plans ensure a coherent and consistent arrangement of records and subsequently form the basis for effective record filing, retrieval, retention, and disposition (Mahama, 2017; Otieno, 2021). They are essential in assigning security status to users, including restricting access to some classes of records as a legal requirement (Simwaka, 2022).

According to Annoh (2019), having a records inventory is another vital management practice that universities always adhere to. He conceded that a completed inventory provides a picture of what records are physically stored, the volume of storage, or how they are classified for future use and retrieval. A records inventory is vital in gaining control of a university's number of records created.

Simwaka (2022) noted that records maintenance and use are essential aspects of records management practices and cannot be ignored. Barigye et al. (2022) clarified that records maintenance involves storing and retrieving records for future use. (Nwaomah, 2017) viewed that to determine a records storage strategy and to ensure that the strategy is adequate, he suggested the following guiding questions:

- Where and how do you store your active records?
- Where and how do you store your inactive records?
- Do you have a "records protection" procedure in the event of litigation?
- How are you storing your electronic records?
- What is the environmental condition of your storage facilities?

When a record is retrieved for use, it is also essential to track it till it is returned to its designated storage area (Dasmani, 2019; Wilkins, 2021). Tracking records practices will help identify who had accessed the record, when they accessed that information, and whether any action was taken or changes made to the record (Iliyasu & Abdullahi, 2017).

Records disposition is thus the least practised part of managing academic records. It is a stage that determines whether a record should be destroyed or retained permanently by the university's legal or disposal procedure.

This chapter included a review of the literature and the theories that informed the study, all based on the research objectives. It showed that the types of records generated depend on the activities conducted in the Academic department; it also demonstrated that the records management practices followed by the Academic department, such as records creation, capture, filing, records storage, providing security to the records could either improve or hamper service delivery. While the extant literature provided a theoretical foundation for the study, little has been known about records management practices and service delivery at All Saints University Lango (ASUL), ARD. To fill this knowledge gap, this study examined the applied records management practices and their impact on service delivery at ASUL.

3 Research methodology

The researcher used a case study design because the researcher wanted to examine the records management practices in a real-life context. The study's target population comprised 22 respondents, including three records staff, three academic registrars, three secretaries, three IT support teams, and ten students (All Saints University Lango, 2020b).

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This study used purposive sampling to select eight respondents, including three records staff, two Academic Registrars, two secretaries, and one IT staff. The main reason was because they were involved in creating and using records in their daily activities. Therefore, as stated in the research objectives, they were required to give their views about the records management practices and how they affect service delivery at ARD, the challenges faced, and the strategies that can be used to streamline them.

The IT support team was required to provide information concerning the technology at the various stages of the records' lifetime. This included ascertaining information on the information management systems currently in use, the structure of the databases, and the measures followed for records creation, records classification, establishing retention rules, and access controls or security rights for records created and managed with IT systems.

Convenient sampling was used to select five students who queued at the academic registrar's office. The researcher used convenient sampling on the students because they were found queuing at the ARD to access the services differently. The researcher used convenient sampling to get information on how quick it was to get services at the ARD. For example, records were consulted first when needing an academic transcript.

The data collection tools consisted of the interview guide, documentary review guide, and observation guide. In-depth interviews were held with the records staff, Academic registrars, secretaries, IT Support team, and the students.

The study also analysed documents such as the student's admissions policy (2021), the Academic Registrars Staff Profile (2021), the Students' Registration Procedures, the ARD Strategic plan (2020-2025), the Annual year report, and the university policy documents to ascertain the context and the environment of ASUL within which the study for records management practice was being done. The documents were also analysed for the obtainability of evidence of the practices for managing records at the Academic Registrar's Department ASUL.

The study was purely qualitative. The collected data was sorted and analysed using content analysis, guided by various themes, concepts, patterns, and categories aligned with the study's objective. Data was coded and summarised to make a meaningful interpretation.

4 Findings and Discussion

The findings presented in this section include the records management practices implemented from creation to disposition. Participants' responses on service delivery were also included.

4.1 Response rate

The statistics in Table 1 summarise the respondents' responses according to their positions at work in ARD.

Table 1: Response rate by category of respondents

S/N	Category/position	Target population	Actual respondents	Percentage %
1	Records staff	3	3	100
2	Academic Registrars	3	2	67
3	Secretaries	3	2	67
4	IT supports Team	3	1	33
5	Students	10	5	50
	Total	**22**	**13**	**100**

Table 1 shows that out of 13 targeted respondents that participated in the study, the majority (100%) were records staff, followed by 2(67%) Registrars, 2(67%) Secretaries, 1(33%) IT supports staff and 5(50%) students. The findings revealed a high participation rate among the records staff and poor response from the IT support team. The participation of many records staff, registrars, and secretaries implies that the university relies on this staff category to perform its records management functions. They had concerns about managing and carrying out records management functions to ensure service quality.

4.2 Duration in service

The information regarding work experience was sought. The participants were asked to indicate the length of time they had been in service of the ARD. Table 2 provides the details.

Table 2: Description of the respondent's years of service (n=8)

Duration	No. of respondents	Percentage %
15years and above	5	63
5-15years	2	25
0-5years	1	12
Total	**8**	**100**

Table 2 shows that most respondents had worked for more than 15 years in the ARD at ASUL. As seen from Table 3, 5(63%) had worked for 15 years and above, while 2(25%) had experience of 5 years, followed by 1(12%) who had served below five years. The data confirms that the respondents had worked long enough to be adequately informed about the records management issues at the Academic Registrar's department.

Participants were asked about the practices of record creation at the ARD. It was revealed that the records were created and received through the admissions process, issuing of transcripts and certification of documents, examination, academic verifications, students' progress reports, receipts of admissions letters, and book registers. Furthermore, they included minutes of meetings and curriculum activities.

During the interview, the participant explained that records details are captured during creation:

> *"We capture details such as file titles, file types, and dates created at this stage. As time passes, files get older, and more details are added to the file cover, including the volume number and* date *for closure."*

Observation revealed that records are created through the process of applications, admissions, enrollment, matriculation, and research reports, which was in line with (Adu, 2014; Musembe, 2016), who found out that academic records are created as students fill in their forms, that is biodata forms, emails, and through registration for example in exams, class attendance, and so forth. However, it was observed that some of the record files lacked index and abstract details, making it hard to capture and track evidence of file movement. This is contrary to (Otieno, 2021), who revealed that when records are created or received, it has to be captured in an appropriate medium after the creation so that they are readily available for institutional support to ensure that the records created are the ones needed and not non-essential records (Otieno, 2021).

Regarding records classification, the participants noted that ARD uses a subject classification system, with records assuming order by subject. However, observations showed that the files shelved were not classified and that the records management staff needed to have a good memory of where the records files are located. This contradicted the findings by (Nwaomah, 2017), who argued that one of the essential elements in gaining control of a university's records is classification and held the view that academic institutions can categorise their records according to classes, forms or grade levels, subject areas or by individuals as well as unitise according to clients, names of projects, or locations.

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Furthermore, concerning records maintenance and use, the participants shared that some files were kept on shelves and cabinets, and others were being heaped on the floor and the desks at the workstations. The records packed in boxes looked decrepit and weedy; the shelves were open without locks. When inquired about such practices, one of the participants stated:

"We normally packed some of the files in boxes and bags to ensure they are not lost. We would have kept them in cabinets and shelves, but they are insufficient. We provide shelves and cabinets, but many departments have reported they are insufficient as the records keep growing."

Observation also revealed that the ARD lacked enough space and thus ended up using available bags and space on the flow to retain some of the records; however, the majority of the staff used the academic records daily to meet the administrative needs of the university and to support decision-making, among other purposes. This finding did not concur with a report by Aminu and Aliero (2019), who stressed that a good storage program should provide proper storage space and tools such as shelves, vaults, and cabinets to store records and to ensure the records are protected and secured from both environmental factors and intruders.

Participants were how regarding records disposition. The study established that the practices for disposing of records were not correctly followed. This originated from the fact that the academic Registrar's office had no policy specifying the procedures for retaining and disposing as reviewed from the available documents that support records management in the ARD, as one of the participants remarked.

"Indeed, we do not yet have a conventional procedure in managing the records; there are no records and information policies that are yet established, and we have not got complaints…and I appreciate this conversation."

When interviewed, the IT team revealed that some of the records in their databases were archived in the cloud, as they lacked enough computers and Internet infrastructure to make their work easy. An IT staff member said:

"There is much work the IT team does. Thus, it would be on the part of the records staff to adequately take part, research, and come up with appropriate records and information manual that will guide in all these practices."

The findings revealed that the record management staff had limited knowledge of records and archives disposition and how to devise a disposition schedule. This was contrary to (Sanwine, 2020), who asserted that records management staff are ignorant of their duties because they did not observe the basic tenets of good records management.

To ascertain feedback from students on service delivery and records management practices. The services were always slow and ineffective as they lined up and spent the whole day being served, especially when processing their transcripts and certificates and verifying their results.

This affected the students, as one of them observed that her marks were noted missing, yet she had sat for the paper, which was later verified, but almost missed graduating.

Observations revealed that the records were hard to retrieve and always took long for students to be served because the records shelved lacked classification numbers and were difficult to sort. This revealed a gap in service delivery at ARD. The above finding was appalling because (ISO, 2011) highlighted that records management practices provide the mechanism whereby a university can account for its decisions and actions and retain corporate memory for effective service delivery. Therefore, there is a call for the ARD to manage its records comprehensively and responsibly to provide quality services to its stakeholders.

5 Conclusion

The findings revealed that although records were vital to running the ASUL academic registrar's office, the Academic registrar department did not have well-defined records management procedures. It was noted that no member with a records and information professional background was assigned the responsibility of managing records in the academic registrar's department. Generally, there was no specified position of a records manager in the university. As a result, records practices were left to the discretion of the secretaries and the records management staff, who had no qualifications or records management training. Therefore, the records management practice in the academic registrar's department was inadequate and needed to be streamlined. This jeopardised service delivery at the academic registrar's office. Records management practices are required at the Academic Registrar's office ASUL as a basis for managing academic records because they are vital for effective service delivery. Gaps that needed to be addressed were identified to minimise the risk of not having records management practices that enhance quality service delivery.

6 Recommendations

The study made the following recommendations:

- In consultation with records management experts, the Academic Registrars should identify and transfer all archival records to a designated storage area and ensure that only records with archival value are maintained.
- The records management staff and the Academic Registrars should also be required for adequate, reliable, and secured storage materials and equipment such as shelves, cabinets, files, and appropriate boxes to facilitate proper storage of ARD records. This will help to solve the problem of keeping records and files in old sacks and polythene bags and piling them on the floor, which exposes them to damage and the risk of losing valuable information.
- The Academic Registrar should also organise training for secretaries, records staff, and IT support personnel by inviting records professionals, experts, and consultants, such as from the Uganda National Records Centre and Archives (UNRCA), records managers, and staff from other universities, to train all staff in the practices of records creation, maintenance, use, and disposition.
- The academic registrar's office should also train records management staff and continue training them in records management to keep abreast with new professional developments.
- Qualified record managers should be recruited to manage the university's records.
- The academic registrar should budget for a robust ICT infrastructure to generate and maintain electronic records. This will mitigate dependency on paper-based records and reduce the storage space challenges experienced in maintaining paper-based records.

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2. Digitising Murumbi Africana Collection at the Kenya National Archives and Documentation Service for Posterity and Ubiquitous Access

Wekalao Ben Namande
Kisii University, Kenya
wekalao.namande@ksu.ac.ke

Abstract

This paper assesses the endeavours of the Kenya National Archives and Documentation Service to digitise its information resources in its quest to give access to millions of documents in its holdings. It gauges the digitisation project, showing what has been done and the challenges experienced. KNADS, under the law, is responsible for taking all practical steps for the proper housing, control, and preservation of all public archives and public records in Kenya (Cap 19 Laws of Kenya). The study aimed to assess the project's success since its inception. The study used a longitudinal approach since it looked at what the KNADS has so far done in 10 years after a similar study that assessed the project of digitisation of archival resources in 2012. Areas examined were the resources deployed in the project, the capacity of staff engaged in digitisation and access to resources digitised. From the literature and data provided by crucial respondents, the digitisation programme's primary purpose was to preserve the original archival materials for posterity and to give ubiquitous access to the information contained therein. It shows the milestones realised and the challenges it has faced so far. It concludes by indicating that although KNADS has achieved considerable progress in ensuring that the most consulted records in its collection are scanned, there is a need to look for new methods to achieve its goal in a shorter period and give ubiquitous access to those records. This paper is relevant in theory and practice to the scholarly community and the information industry, especially archival institutions.

Keywords: *Digital archives, e-citizen, digital records, brittling, business continuity, disaster management*

1 Introduction and context to the study

One of the primary methods of building digital collections is digitisation, which is the electronic process of converting information from an analogue to a digital format. It is also a high-speed data transmission technique that entails the conversion of any fixed or analogue media, such as books, journals, articles, photos, paintings, maps, and microforms, into electronic forms through scanning, sampling, or rekeying using various technologies. Its concern is creating digital images and presenting them on a local computer area network for in-house use or the Internet for broader accessibility and use. Optical character recognition technology is needed to transform the scanned image into a hypertext document (Devi & Murthy, 2005).

According to Wide Technologies Limited (2021), digitising information makes preserving, accessing, and sharing easier. For example, an original historical document may only be accessible to people visiting its location. However, if the document content is digitised, it can be made available to people worldwide. Karari (2020) cites the case of digitisation of the records of the Ministry of Lands (Kenya), in which she posits that the concept of digitisation of the Lands Registries in Kenya began in 2013 to give effect to sections 9 and 10 of the Land Registration Act 2012Another case of records digitisation in Kenya is the Civil Registration Department (CRD). With advisory and technical aid from the ICT Authority, the Ministry of State for Immigration and Registration of Persons has digitised birth and death registers in the country. The exercise aimed to consolidate information found in the National Population Register. Consequently, a national database was created in 2008/2009 that established demographic records for all Kenyans aged 18 years and above on a single platform. There are over 107 Civil Registration Centres where parents can register births,

and any family member can register deaths. To this end, it is estimated that over 62.5 million records have been digitised. As a result, an organised registry now has improved records storage and accessibility, improved transparency, and increased efficiency in retrieving records (Ministry of Lands, 2020). In the Judiciary of Kenya, efforts have been made to digitise records. For instance, 60 million records were digitised under the High Court Registry digitisation project and the document in which the Document management system was established. The benefits of digitising included easy search and retrieval of files, a more efficient registration process, automation of filing of returns, and, more importantly, speeding up the delivery of justice.

According to the ICT Authority of Kenya (2023), the Company Registry has also been digitised. The Companies Registry is responsible for registering business names and limited companies. Three hundred business names are registered, and 200 companies are incorporated daily. The digitisation process saw records from 1936 to 2010 scanned and the data captured to allow for an online search of company names and information. In all, 25 million pages have been scanned and stored. The benefits of this initiative were the provision of high-end servers that efficiently handle over 1,000,000 company files and store the scanned documents in a format that can be linked to a searchable database; increased transparency and much faster access to company registry services; an easier and faster way to incorporate new companies, reducing the registration process from two weeks to one day; registration of companies from anywhere in the country, and consequently avoiding the need for a physical visit to the companies registry in Nairobi. Further, with the government policy that at least 10000 government services will be made available via the E-Citizen platform by the end of 2023, over 5,084 services have been digitised. To enhance the uptake of these services, the government has implemented plans to advance digital literacy in Kenya.

2 Digitising archives

KNADS was established by an Act of Parliament in 1965 to take all practical steps for the proper housing, control, and preservation of all public archives and public records of enduring value and to make them available for public access (Public Archives and Documentation Service Act, Cap 19 Laws of Kenya). The weight of this responsibility is rapidly changing in the current digital environment and has become a real challenge. It is worth noting that some archival records and media are old, brittle, and delicate, which requires careful handling. Besides, continuous and long-term handling and use have exposed them to wear and tear. It was, therefore, important that the Kenya National Archives and Documentation Service actively intervene to ensure that these records are available today and in the future. The use of archives is the goal that all archivists endeavour to achieve. However, the availability of archives for use by the public, and indeed all other aspects of archives management, depend on archives being adequately preserved and cared for and being made available to users all over the world through contemporary techniques and, therefore, the need to digitise records (Mwangi, 2019).

However, no matter how well records are protected and cared for, they cannot enjoy an unlimited lifespan. Internal processes of decay ultimately defy even the most sophisticated intervention by archivists. Against this backdrop, KNADS digitised its most endangered archives and records in 2007. This has involved digitising some of its oldest and most heavily used archival materials, some dating back over 100 years. The digitisation proposal to JICA (2007) indicates that the oldest publication dates back to 1673. According to Mwangi (2019), this programme has resulted in the digitisation of close to 12,000,000 documents of archival records (KNA/8/2 Vol.11), though the KNADS home page talks of over 13,000,000 documents as having been digitised. While this may sound like a considerable number, it is a tiny portion (3%) of the more than 680 million pages of archival materials in the custody of the Kenya National Archives and Documents Service.

In 2007, the Kenya National Archives and Documentation Service (KNADS) started digitising the then Coast province records held at its Nairobi Headquarters. Emphasis was placed on materials that are heavily

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used and those that are physically deteriorating. They were estimated to number slightly over 1.7 million bound and loose pages. These records were selected because of their age and heavy usage by clients; it was argued that reformatting them into digital copies would allow broader use and ease of access while preserving the original. By digitising these records, the original would safely be preserved while the digital surrogates would be used for access.

These materials were intended to be made available for online ordering through the KNADS website. The department also acquired a state-of-the-art records management system capable of managing paper and electronic records. This was anticipated to serve the department's records management needs and act as a resource where other public organisations wishing to automate their systems could learn about best practices (Kenya National Archives, 2022).

3 Problem statement

From the above excerpt titled 'Overview of the Automation Programme at KNADS' and corroborated by Mwangi (2019) in his paper titled 'The Road to Providing Access to Kenya's Information,' The Kenya National Archives and Documentation Service has been digitising its records since 2007 for purposes of preservation and access. Despite the great stride made and heavy financial investments in acquiring state-of-the-art facilities and digitising information resources by the government, the paradox is that the 'digitised' resources are not only still inaccessible online but are loudly absent on the organisation's local area network and website since any attempt to search for digitised images from the institutions network disappointingly yields no results. Despite the four-phase attempt to digitise over 680 million pages of records, the process has experienced myriad challenges. This calls for evaluating the exercise regarding time and resources, milestones, and challenges vis-a-vis the context of financial, human, and return on investment. The construct worth interrogating is the extent to which digitisation has been realised.

The paper sought to establish the status and milestones achieved in the digitisation endeavours at the Kenya National Archives and Documentation Service in the context of preservation and ubiquitous access to information resources.

4 Related literature on digitisation of records in Kenya

According to Manžuch (2017), digitisation is undertaken as part of a process that includes selection, assessment, including of needs, prioritisation, preparation of originals for digitisation, metadata collection and creation, digitisation and creation of data collections, and submission of digital resources to delivery systems and repositories. This process is accompanied along the way by management, including intellectual property rights management, quality control, and evaluation. These steps are essential to ensure that the digital object remains accessible in the long term. Digitisation helps protect precious documents from excessive handling. It allows the preservation of a facsimile of the document (not the document itself) and ensures multiple access to the content, with due respect for intellectual property and other rights.

According to Wangui (2011), the decision to digitise may be:

- Increasing and improving access is the most prominent and primary reason why there is a high demand from users, and therefore, an organisation wants to improve access to a specific collection.
- It also seeks to improve services to an expanding user group by providing enhanced access to the institution's resources, including those related to organisational learning, research, and development.
- Digitization also helps to reduce the handling and use of fragile or heavily used original material and creates backup copies for endangered materials such as brittle books or documents.

- Another force behind digitisation is the desire to develop collaborative resources and share partnerships with other institutions to create virtual collections and increase worldwide access

According to Azim et al. (2018), digitisation of records is essential in that it offers the following potential benefits: more than one person can use records, they can be accessed at any location, it offers better integration with business information systems, it allows easy access to records regardless of the original format, it can be backed up during disaster, it is protected and secure, it saves space, and it improves an organisation's productivity.

Organisations seeking partnerships with other institutions to capitalise on the economic advantages of a shared approach find digitisation an enabling avenue to achieve that goal. Organisations can take advantage of financial opportunities, such as the likelihood of securing funding to implement a programme or a particular project generating significant income (Wangui, 2011). Digitisation can also ensure the availability of critical business documents for business continuity and disaster recovery.

All these processes result in digital information centres, which are facilities in which collections are managed digitally rather than print, microform, or any other media and are accessible by computer.

With the transformation from traditional print collections into versatile electronic resources, information, including full text, can now be accessed from laboratories, offices and homes 24 hours a day. With the introduction of the digital age, the library and information profession has assumed new trends and therefore, library and information professionals have to keep themselves abreast with current technology (Namande, 2012)

According to Ariole et al. (2017), librarians must prepare themselves to transform from an era of scientific management to systems and structural management. Tennant (2004) asserts, 'We must have people who can constantly learn, foster change, and create new collections and services. Some of these people are in our buildings; others must be hired. We must train, support and encourage them.

The Kenya National Archives and Documentation Service, established in 1965 by an Act of Parliament, provides custody to public and private records of enduring value, among other functions. It is worth noting that some information resources at the Kenya National Archives were created as early as the 17th century. Some old materials have deteriorated due to environmental and biological dangers, becoming fragile, brittle, and discoloured. This situation justifies the need for long-term availability of such resources.

Murumbi Africana Collection is a special and unique collection of rare information materials that were bequeathed to the government by Joseph Murumbi, the second Vice President of the Republic of Kenya, whose passion was collecting artefacts and information resources rather than politics. The collection is unique and comprises resources from all over the world, some of which are in Amharic, German, French, Turkish, Italian, English Zulu, Lingala, and local languages such as Gikuyu, Dholuo, Luhyia, Kalenjin, and Maa, among others. It is worth pointing out that these documents are as old as History; some were published as early as 1673. Indeed, it is a rare collection that is not only about Kenya but also about a greater global heritage (Kenya National Archives and Documentation Service, 2007).

Against this backdrop, there were spirited efforts to preserve the resources for long-term availability, posterity, and ubiquitous access. According to the document on contents of the Murumbi Africana Collection (Kenya National Archives and Documentation Service, 1989), the Murumbi Africana Collection has over 10000 publications comprising books, periodicals, Gazetteers, official reports, and other loose document files. Most of these resources are patronised by researchers from the local and international fronts. However, not all of them are adequately used due to limited accessibility challenges. This could have been among the motivating reasons behind the digitisation initiative. Besides, the dusty and stuffy environment, exposure to the pollution emitted by motor vehicles plying routes around the archival facility, sunlight, chemicals from regular paints

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and vanishing make the materials potential candidates for yellowing, brittle, and resultant breaking and disintegration. The situation is worsened by an ill-equipped document hospital centre for such damaged and endangered resources; the centre only provides first aid to documents using chemicals, tissue repairing, pasting, inlaying, malt merging, solvent lamination, and resizing. The irony is that this is not the ultimate solution since, to some extent, its preservation measures add up to further damage and weaken the books' texture, print, and condition. Because this process is cumbersome and expensive, digitisation was resorted to to enhance preservation and accessibility (Kenya National Archives and Documentation Service, 2008).

Digitisation of information resources at Kenya National Archives and Documentation services aimed at digitally preserving content and context of archival records and other endangered publications for access and dissemination. It was anticipated that an institutional digital information infrastructure (repository) would be created to ensure the preservation and longevity of archival information resources. This would have resulted in online record search databases where researchers can submit requests for records. Therefore, multiple, faster, cheaper access to archival resources and services would be guaranteed. Statistics show a steady increase in the number of materials utilised for academic research from 4600 in 2001 to 5900 in 2004, over 7000 in 2008, and about 10,000 currently. Against this backdrop, Namande (2012) adds that digitisation, if pursued in its logical conclusion, would save researchers physical visits to the Search Room and the expenses of paying for reprographic services. It would have also gone a long way in enhancing the exploitation of archival resources by the global research fraternity.

In its endeavour to convert information resources into digital format, the KNADS has partnered with other government organisations. The National Council for Law Reporting and the National Assembly are critical to this venture.

5 Methodology

This paper assumed a longitudinal study and purely qualitative approach because it is a follow-up of a similar paper by Namande (2012), which assessed the project of digitisation of archival resources at the KNADS. This paper attempts to evaluate the status quo of the project with reference to Murumbi Africana Collection (MAC) hereafter, a specialised collection and the milestones reached. Its design is descriptive and purely a qualitative approach.

The study population included all staff at the Kenya National Archives and Documentation Service headquarters in Nairobi and the most frequent and longtime users of search room services.

Purposive sampling was applied to pick the senior management, and the two deputy directors, the head of the search room and education services, the principal librarian, the head of ICT and project manager, and the technical staff were selected for the interview. The choice of these respondents was premised on the fact that the senior members played strategic roles in the whole process, formulating policies and determining resource distribution. The technical staff were picked on because they were best placed to give information since they are the ones who interact with the system and, therefore, drive the process of digitisation. For the users, the selection was simple random sampling in which the study identified subjects from the user statistics register based on their length of use (the longer the use of search room services, the higher the chance of being picked for the study. The other consideration for user selection was the frequency of use of the archival services. It was assumed that those who have used the facilities for a long time and frequently are more likely to have experience using digital resources and, therefore, could provide reliable information.

The critical data collection instruments were an interview and documentary review schedules. The interview schedule guided the researcher in probing the respondents on the milestones attained in digitisation, staff capacity, and equipment. In contrast, the documentary review schedule guided the researcher in getting some missing details to triangulate data elicited from the respondents. Interviews were face-to-face, and where not

possible, they were carried out through telephone conversations. The researcher noted critical issues while the mobile phone was used to record the conversation for detailed transcribing at the data analysis stage.

The data analysis assumed a qualitative pattern. The respondents were coded as R1, R2, R3, R4, R5, R6, and R7 to encrypt their identities for fear of reprisals for giving out confidential information. The voices of respondents were quoted verbatim before discussion and interpretations. Subsequently, inferences were made from the interpretations.

6 Results

This section briefly summarises the results of the interviews conducted with key respondents. Notably, not all the targeted respondents were available for the interview. Two out of the six earmarked respondents were unavailable, and respondents R2 and R6 did not participate because they had travelled out of the station for other related work and professional engagements.

The respondents were coded as R1, R2, R3, R4, R5, and R6 for anonymity purposes.

The following, then, is the verbatim response and the subsequent interpretation of the voices:

Regarding the milestones achieved, R1 said,

> *"Over 12 million documents have been digitised since 2007; however, they cannot be accessed online. In other words, our documents have been reformatted into electronic formats such that, in a way, we have mitigated against disaster."*

KNADS has achieved one of the objectives of digitisation, which is repackaging the records in digital format. R3, on the other hand, was of a contrary opinion:

> *"Digitisation is complete if and when the digitised records are not only available in digital copies but also if they can be accessed electronically regardless of time and space".*

In this case, there is no ubiquitous access to the KNADS information resources despite heavy investment in resources such as time, human, and financial resources. Asked further on why he thought the process stands incomplete, R4 challenged the researcher:

> *"Visit the archives website and see if it is operational! If it is, click on digital resources and tell me if you can access KNADS digital materials; nothing."*

To R4, digitisation is more than repackaging resources into digital formats; it should facilitate remote access so that users do not have to visit the National Archives to use archival materials physically.

Asked to confirm the return on investment in the digitisation project, R5 retorted,

> *"There is no direct and visible benefit derived from the ever-increasing financial resources invested in the project by the government. In fact, there has been more damage and misfiling of the physical records, which the project sought to address. This is because commercial entities have always performed the work with little or no professional background in records management, which uses school leavers or university graduates with no basic professional socialisation in records management. They have added more harm than good to our records."*

Besides, all the respondents agreed on some of the challenges facing the digitisation process, as reflected in what R5 observed,

> *"As an institution in a third-world country, KNADS faces myriad challenges ranging from inadequate staff capacity, mishandling of records, poor connectivity, unstable power supply, and apathy among staff members, among others."*

The above views summarise the general perception of the digitisation project, which is seen as not having achieved the objectives for which it was started. Document misfiling interferes with and distorts the story

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that the record is supposed to tell. If KNADS uses personnel with no records management background, the project can be a disaster in waiting.

7 Discussion of findings

Digitisation has seen over 20 million pages reformatted through scanning; however, digitisation, as initially envisaged, has not been realised. This implies that the envisioned digital content cannot be accessed seamlessly; users can only access the materials manually in the search room section of the Kenya National Archives and Documentation Service. In fact, the scanning of documents has interfered with the sanctity of original orders in some records due to the misplacement and misfiling of documents. This compares starkly with Azim et al. (2018), who emphasised that it is not advisable to destroy, mix or rearrange the non-digital source records after the digitisation process; records have to be retained in their original format and, in some instances, non-digitised records may even need to be retained along with their digitised counterparts for some time.

Secondly, the Murumbi Africana publications, initially identified for digitisation because they were single, rare, and brittle, were partially scanned and later abandoned when preference shifted to archival records due to conflicting interests. In other words, the KNADS management got their priorities wrong. Last but not least, the KNADS has continuously suffered challenges regarding quality and quantity in staffing levels, poor connectivity, and an unstable power supply. This hurts the entire digitisation project. This correlates with Laksilu, W.B.L (2022), who cites lack of resources, digital capability, inadequate human resources, technical barriers, poor competencies and skills and inadequate funding as the challenges facing digitisation projects in most organisations. Bosibori (2013) emphasises digitisation being challenged by many factors, including financial constraints, inadequate personnel in the projects, poor handling of original documents and inadequate resources and infrastructure for digitisation. Equally, technical know-how of project staff and procurement procedures hinder effective digitisation in government departments. The issue of human resources is of great concern, where the KNADS has consistently made use of school leavers or college graduates with no background in information or records management, posing more dangers to the materials that must be digitised for preservation and access. Finally, despite the significant financial and time resources invested in the project, there are few investment returns.

8 Conclusion

The Kenya National Archives and Documentation Service has made strides in the right direction by trying to digitise its collections. However, unless it fixes the identified challenges, the project will remain a circus and, at best, a mirage. It should be remembered that when a similar study was done in 2012, the results were almost the same; the new development worth mentioning is the increase in the number of documents scanned to over 12 million so far. For the organisation to realise its dual objectives of preservation and ubiquitous access to its holdings, it must adequately deploy its resources to crucial problem areas for a successful digitisation process. The day that the KNADS resources will appear on both her local area network, homepage, and global network will be a significant milestone in that KNADS collections will no longer be restricted to the four walls but available globally for an international readership and more so at a cost to recoup resources input in the process. In the interim, the dual need for digitisation to preserve and provide ubiquitous access is a mirage for as long as the process ends with the scanning of documents.

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EMERGING LIS ROLES IN THE DIGITAL ERA

3. Bridging the Digital Gap: Digital Literacy for Maximising E-Resource Usage at Kenya Revenue Authority Library

Mwendwa Mary*; Surtan Faith**; Wekalao Ben Namande***

Kenya Revenue Authority

*mary.mwendwa@kra.go.ke; **faith.surtan@kra.go.ke

***Kisii University*

wekalao.namande@kisiiuniversity.ac.ke

Abstract

In consecutive customer satisfaction surveys conducted at the Kenya Revenue Authority (KRA) over the last five years, a notable gap surfaced as staff consistently expressed unavailability of relevant reference and reading materials in the library. In response to this feedback, the library initiated targeted engagements with staff in the North Rift and Central regions, where satisfaction levels were deficient. The targeted engagements aimed to have an investigative discussion on identifying the reasons behind this dissatisfaction and provide user education and information literacy. Surprisingly, the findings revealed that the challenge did not primarily lie in the unavailability of relevant resources; instead, it was rooted in a lack of awareness regarding the existing e-resources and deficient digital literacy skills about accessing and navigating these valuable materials. The purpose of this study was to explore how library user awareness coupled with digital literacy enhances the utilisation of library electronic resources. The study used a mixed method, and data was gathered using questionnaires, interviews, and focus group discussions. The population comprised 1,169 Kenya Revenue Authority staff stationed in the North Rift and Central Regions. A sample of 624 staff/library users in North Rift and Central regions were purposively selected for interviews and focus group discussions. Based on participants in the focus groups and digital literacy engagements, post-engagement questionnaires were distributed to all 384 to assess how they interacted with e-resources after that. Results revealed that user awareness and digital literacy engagement significantly affected e-resources utilisation as staff expressed confidence in e-resources accessibility and their navigation skills on database platforms.

Keywords: *Information literacy, remote access, eBooks, customer care, customer satisfaction*

1 Introduction

In the ever-evolving landscape of the digital revolution, state corporations are at the forefront of seamlessly integrating diverse information technologies to enhance their operations and services (Aker, 2017). One such agency is the Kenya Revenue Authority (KRA), and at the core of its operational framework is a specialised library that serves as a vital nexus for information management, research, and collaboration. While recognising the indispensable role of virtual and digital services and the paradigm shift in the proliferation of electronic resources, the special library embraced modern information technologies and services. Through subscriptions to electronic resources facilitated by the Kenya Libraries and Information Science Consortium (KLISC), the Authority Library has enriched its traditional collection, ensuring a comprehensive knowledge repository. These electronic resources are accessible both remotely and within the KRA intranet, providing a seamless and technologically enriched environment for the diverse workforce spread across seven regions in Kenya.

The utilisation rate of this subscribed electronic resource is one of the Key Performance Areas measured in the library, thus the need for concerted efforts to increase their usage. The library tracks and measures comparative usage periodically (monthly, quarterly, and annually) and proactively improves the Library Usage Index. While taking cognizant of satisfaction levels, the library implements several initiatives, which include the induction of new KRA staff to the library, desk-desk engagement, targeted engagement, and

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circulation of email alerts, among others, all these to educate the user and build their capabilities to access and effectively utilise Library resources and services.

2 Statement of the problem

Despite the commitment to increase awareness and information literacy programmes coupled with targeted user follow-ups, a discernible gap persists in utilising library resources. This is revealed in the Customer Satisfaction Survey conducted by the KRA Survey team in 2020 and 2022 and the Strategy Innovation Risk Management (SIRM) departmental survey in 2023. These surveys focused on whether staff were satisfied with available library references and reading materials. In all the surveys, a notable gap surfaced as staff consistently expressed dissatisfaction with the relevance of reference and reading materials, prompting the library team to take proactive measures.

In response to persistent gaps, the KRA library team initiated targeted engagements with 1,162 North Rift and Central staff who were least satisfied (SIRM internal customer satisfaction report (FY 2022/2023). Surprisingly, the findings of the targeted engagements revealed that the challenge did not primarily lie in the unavailability of relevant resources; instead, it was rooted in a lack of awareness regarding the existing e-resources and deficient digital literacy skills about accessing and navigating these valuable materials. The library team delivered digital literacy sessions concerning resource access and navigation and has since revamped awareness campaigns. Here, we ask if the awareness campaigns coupled with digital literacy sessions were effective. Therefore, this study aimed to explore how library user awareness coupled with digital literacy initiatives ultimately bridges the gap in the digital divide – particularly access and navigation, thus enhancing the utilisation of library electronic resources.

The following research objectives guided this study to examine the types of e-resources offered by the KRA library to its users, investigate awareness of the availability of e-resources among KRA staff, assess the impact of digital literacy training on the utilisation of e-resources by staff in the North Rift and Central regions, identify the specific challenges faced by KRA employees in North Rift and Central regions in utilising e-resources effectively and recommend possible solutions to these expressed challenges.

3 Literature review

3.1 Types of e-information resources

Electronic information resources, called e-resources, have received considerable attention from scholars. They describe e-resources as digitally formatted or available materials, encompassing text, graphics, and digital reading materials accessible online via a virtual space or offline through computer-based systems. These resources include E-databases, E-journals, Ebooks, E-magazines/e-zines, e-thesis and dissertations, e-reference books, blogs or weblogs, e-encyclopedias, among others (Roy & Barooah, 2019; Kavithanjali, 2019; Jotangia, 2020; Gosavi, 2021; Ugwu & Onyegiri, 2013; Ekere et al., 2016; Ofordile et al., 2019). Kavithanjali (2019) and Gosavi (2021) further specify examples of electronic journal databases such as EBSCO, JSTOR, SAGE – Journal, Science Direct, and ProQuest Central as examples of ebooks.

KRA library, mindful of the importance of 24/7 accessibility and availability of e-resources, as emphasised by Ugwu and Onyegiri (2013) and Joshua and King (2020), provides subscribed ebooks and journals to complement its print collection. These resources are available in their thousands and are accessible via the intranet/Local Area Network (LAN) and remotely through the off-campus platform. However, despite their popularity in academic institutions, as Joshua and King (2020) asserted, these resources are not fully utilised within the KRA user community.

It is worth noting that the ability to access and use e-resources extensively depends on user awareness, information, and digital literacy skills. This study explores the types of library e-resources provided at the

KRA Library and determines how user awareness campaigns and digital literacy initiatives enhance their access and use.

3.2 Awareness of e-information resources

Awareness is defined as the state of knowledge concerning something that exists or understanding of a state of affairs or subject at the current time based on information or expertise. It is also seen as knowledge or perception of a situation, facts, recognition, consciousness, realisation, and acknowledgement concerning an explicit state of affairs or development. Awareness and using e-resources are essential; therefore, they can access the required information to keep users alert of the available media (Kimanga & Namande, 2021; Ansari, 2020). While noting that using e-resources requires special ICT skills, facilitating users to navigate the maze of resources on their devices, Ansari (2020) stressed that awareness was the core. It is pertinent to note that when research scholars are aware of e-resources, they use them fairly for academic and research purposes.

Consequently, Bhatia (2011) opines that most users access e-resources to update their knowledge on their respective subjects and for academic assignments. Thus, libraries should organise awareness and training programmes and seminars to educate the users and disseminate helpful information to maximise the use of library resources and services (Saikia & Gohain, 2013). Therefore, awareness is a significant feature in utilising e-resources, and a lack of it, as featured in KRA, could lead to a misconstrued perception of the relevance of library e-resources.

3.3 Digital literacy and utilisation of e-information resources

Accessing and utilising e-resources greatly depends on user information and digital literacy skills. Digital literacy can be defined as the set of attitudes, understanding, and skills needed to handle and communicate information and knowledge effectively in various media and formats. Digital literacy skills can also be considered as the ability to utilise information from a variety of digital sources, including accessing, using, and evaluating information. Ilori et al. (2023) agree with these definitions and call for acquiring digital literacy skills.

Digital literacy involves having the right skills needed to thrive in this age of technology, not only for learning and workforce readiness but also for fostering more open, inclusive, and secure societies. Digital literacy skills encompass the knowledge and abilities necessary to effectively utilise digital tools and resources available in the technological world, which both library users and staff must possess (Ilori et al., 2023). As key facilitators, librarians should be digitally literate and transfer the skills to their customers.

Abbas et al. (2019) note that technological advancements are giving rise to new possibilities, practices, and demands, leading to various new literacies. Digital transformation in corporate libraries necessitates users' ability to navigate, evaluate, and harness the potential of electronic resources. Jaeger et al. (2012) emphasised that digital literacy goes beyond mere access to digital technologies to effective utilisation of digital technologies.

Spires et al. (2019) categorise intellectual processes associated with digital literacy into three categories: locating and consuming and creating and communicating digital content. They highlight the importance of critical evaluation in interacting with online resources to ensure accurate and directed inquiry. In the context of the reviewed literature, integrating awareness campaigns and digital literacy initiatives becomes essential for meeting the evolving needs of library users. Consequently, this study explores the role of digital literacy skills and their effects on using e-resources among KRA staff in the North Rift and Central regions.

3.4 Challenges using e-information resources

Indira (2020) identified several discouraging factors that hinder the use of e-resources, including slow Internet connectivity, lack of a well-organised library homepage with links to e-journals, and insufficient awareness about e-journals. Other obstacles mentioned were insufficient e-resources in subject areas, inadequate training on how to use e-resources, and preference for print resources. Earlier research concurred with these factors and mentioned additional challenges such as power outages, inadequate computers, lack

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of access to full-text citations, inadequate computers and lack of trained and qualified library professionals, improper guidance, insufficient e-resources, economic hindrances and high subscription costs.

Technical problems such as difficulty opening links to e-resources on library websites, non-user-friendly interfaces, and downloading full-text documents were also significant barriers to e-resource utilisation (Jotangia, 2020). The inability to browse archived databases from previous years, poor database searching skills and difficulty in downloading, printing, or saving articles were additional technical hindrances posed by Hendal (2020). Momanyi et al. (2018) found ineffective Information Literacy (IL) programs and inadequate IL skills as the main hindrance at Maseno University, while Acheampong et al. (2019) included trial and error as an additional unique experience in the access to e-resources by students at Kumasi Technical University.

This paper credits the recommendations suggested by earlier studies, such as practical hands-on training by Jotangia (2020), awareness creation, training, and resolving Internet problems by Acheampong et al. (2019) and acquiring standby power generating systems and increasing institutional bandwidth by Akinola et al. (2018), to overcome these issues.

4 Methodology

The study used a parallel mixed-method approach to collect data, combining qualitative and quantitative methodologies. Qualitatively, a descriptive design was employed, involving interviews and focus group discussions to gather in-depth insights from participants. At the same time, quantitatively, an online survey method was utilised to collect statistical data from respondents via online questionnaires. Collected data was analysed separately and integrated into the interpretation and discussion of findings to develop a complete understanding of the phenomenon. The research design was adopted with the hindsight that it should be flexible enough to address questions using the most appropriate method without inhibiting discovery and innovation (Yin, 2014).

The study was limited to the KRA library and KRA staff stationed in the North Rift and Central regions as users of library e-resources. Purposive sampling was employed as the primary method for selecting participants and stations. This method allowed the intentional selection of 13 North Rift and Central stations and fifteen (15) library staff. The decision to use purposive sampling was guided by the need to address the specific challenges revealed by the Strategy Innovation and Risk Management (SIRM) departmental internal survey on customer satisfaction with using library resources. In this survey, North Rift and Central region staff reported low satisfaction with library resources. Purposive sampling was thus the preferred procedure to ensure a targeted and relevant sample for the study. The study targeted 15 library staff and 1,169 staff stationed in the North Rift and Central region and purposively sampled 609 staff while factoring in Krejcie and Morgan's (1970) sampling table.

Table 1: Sample population and size (n=609)

Study regions	Stations	Population	Sampling method		Data Collection Method
			Purposively selected Sample size	Krejcie & Morgan (1970)	
KRA Library staff	Nairobi & North Rift Regions	15	12		
North Rift region	Suam	11	10		Physical focus group discussions
	Kitale	59	48		
	Kapsabet	15	15		
	Eldoret	313		175	
	Lokichogio	11	10		
	Lodwar	32	22		
	Kapenguria	12	12		

Study regions	Stations	Population	Sampling method		Data Collection Method
			Purposively selected Sample size	**Krejcie & Morgan (1970)**	
NORTH RIFT TOTAL		**453**	**117**	**175**	
Central Region	Thika	167	66		Virtual Focus group discussion
	Kerugoya	27	10		
	Nyeri	447		205	
	Murang'a	30	10		
	Nanyuki	30	17		
CENTRAL REGION TOTAL		**701**	**103**	**205**	
Grand Total targeted		**1,169**	**600**		

Qualitative data was gathered through observation and focus group discussions, while quantitative data was collected via online surveys. Thirteen focus groups were organised based on station locations, with virtual discussions held using the WebEx platform for stations in Nyeri and both virtual and physical engagements conducted at various stations in the North Rift region. Digital literacy engagement was integrated into all sessions to guide discussions effectively. Post-engagement data was obtained through online questionnaires distributed to 600 respondents via email, and analysis was conducted using statistical methods for quantitative data and thematic analysis for qualitative data.

5 Findings

This section presents findings as established from analysed data, presented in the order of objectives.

Table 2: Showing response rate

Interviews		Target sample size	Interview	Percentage (%) of Total (n=624)	Quest.	Resp.	(%) N=384
Library staff		**12**	**12**	1.92			
North Rift Reg.	Suam	11	10	1.6	204	152	39.58%
	Kitale	48	48	7.69			
	Kapsabet	15	15	2.4			
	Eldoret	175	87	13.94			
	Lokichogio	11	10	1.6			
	Lodwar	32	22	3.5			
	Kapenguria	12	12	1.92			
	North Rift Region Total	**304**	**204**				
Central Reg.	Thika	66	66	10.57	180	100	26.04%
	Kerugoya and Nyeri	10	10	1.6			
	Nyeri	205	77	12.33			
	Murang'a	10	10	1.6			
	Nanyuki	17	17	2.72			
	Central Region Total	**308**	**180**				
GRAND TOTAL INTERVIEWED		**624**	**396**	**63.39%**	**384**	**252**	**65.62%**

5.1 Types of e-resources available at KRA library

This question was specifically for library staff as they had details of the library collection. The study purposively sampled 12 library staff and interviewed all (100%). The revelations of this interview were as

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discussed below:

5.1.1 Does your library subscribe to e-resources?

Senior Management B: "Yes, agreeing to incorporate e-resources was a strategic decision for the KRA Library. It aligns with our commitment to providing staff with the tools they need for continuous learning and staying ahead in the ever-evolving field of taxation. In addition, the resources subscribed through KLISC include ebooks and e-journal databases. In contrast, the Authority library subscribes to several other e-resources, including e-magazines such as TAXPRISM magazine, published by the Kenya School of Revenue Administration (KESRA).

"Library User A: "Yes, having e-resources at the KRA Library is a game-changer. I can access crucial information from my desk, saving time and ensuring I stay updated on tax regulations and industry trends. I am a frequent user of OECD, Emerald and ProQuest databases."

Feedback from library staff revealed a diverse range of e-resources available at the KRA Library.

5.1.2 What platforms are provided by the library to users to access e-resources?
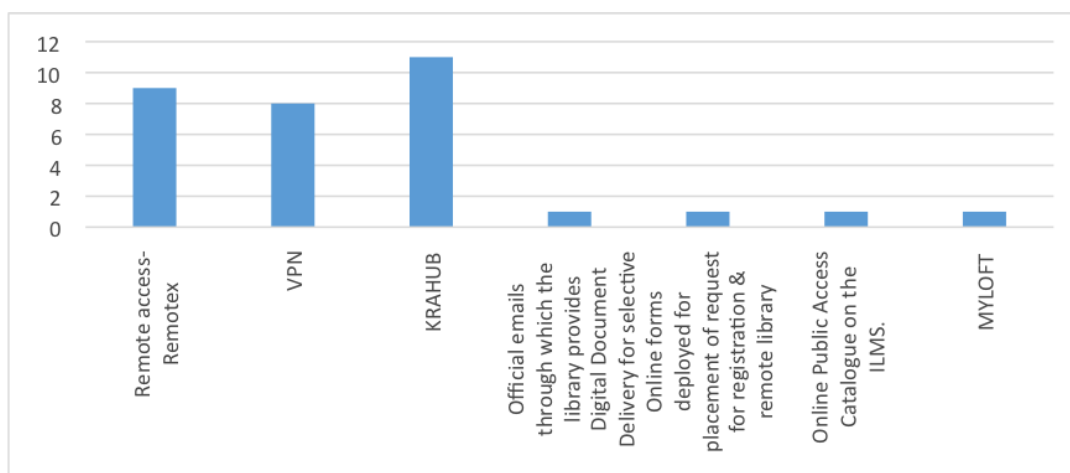
Figure 1: E-resource access platforms

The study sought to determine the platforms provided by the library for accessing e-resources. The research confirmed that the KRA library provided access to e-resource databases on various platforms, as projected in the above bar.

- Eleven staff (91.6%) said KRA library users had access to library resources through their workstations via the KRA intranet on the organisational hub called "KRAHUB." In comparison, nine staff (75%) said library users accessed e-resources remotely from the comfort of their locations or regional workstations via a platform called "REMOTEXS."

- Eight library staff (66.66%) reported that KRA installed a Virtual Private Network (VPN) on their personal and office laptops. This allowed KRA staff to connect digitally between their laptops and a KRA remote server, enabling staff to access library resources via KRAHUB while in remote locations.

- One library staff reported that the library circulated official emails through which the library provides Digital Document Delivery for selective inquiries made at the individual level and deployed Online forms to place requests for registration and remote library reference services. Additionally, one library staff (11.1%) mentioned MYLOFT (My Library on Figure Tips) – this

is a mobile App allowing KRA staff to access library e-resources through their mobile phones. However, the response hesitated to discuss it further, saying the mobile app was barely a new venture and staff had yet to be inducted through it.

An examination of the KRA library webpage confirmed that the library truly subscribed to the above e-resources. Staff access was provided through the KRAHUB and REMOTEXs platforms, with VPN provided to those staff who requested it via the ICT Division.

5.1.3 Challenges experienced by e-librarians while providing user support
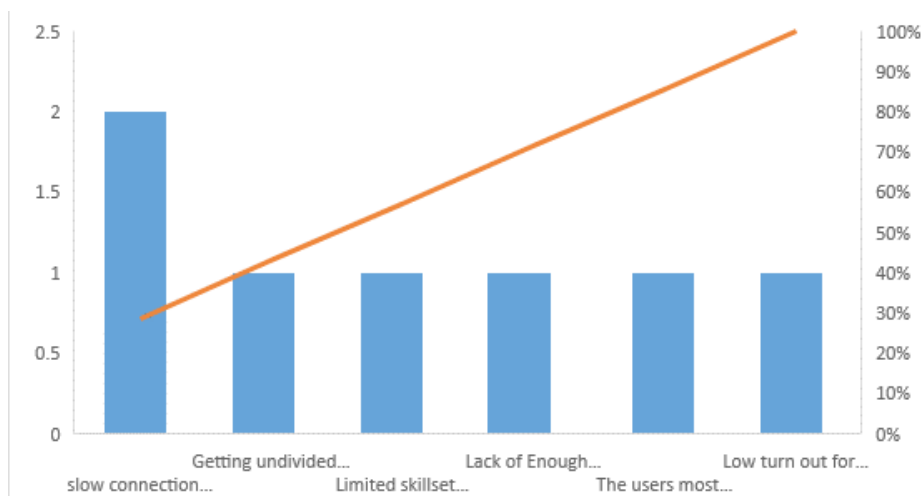
Figure 2: Staff challenges in offering user support for e-resource access

The interview revealed that two library staff experienced erratic slow network connections and occasional system downtimes. However, these staff appreciated ICT Division support services as they acted promptly to resolve reported downtimes. One library staff member reported challenges in offering user support, specifically with virtual literacy programs, where they noted that KRA staff had difficulty focusing on online demos as they multitasked at their workstations. Commenting on this, one staff member mentioned experiencing low turnout for virtual online literacy programs and recommended physical literacy interactions for effective training. In contrast, others suggested properly scheduled online sessions on less busy calendar days. It was evident that some of the library staff felt they lacked adequate digital literacy skills and expressed a need for training, as reported by one of them. Confirming this, Indira (2020) pointed out the lack of trained and qualified library professionals to provide services in digital libraries as a hindrance to e-resource utilisation.

5.2 E-resource user awareness among KRA staff in North Rift and Central region

Data on e-resources user awareness was collected through virtual and physical focus group discussions to find out how users were interacting with available e-resources prior to the digital literacy program, while online questionnaires were used to collect feedback for post-digital literacy feedback. While the online Questionnaires were distributed to all 384 staff engaged in North Rift and Central Regions, feedback received was from 252 respondents (100 from Central and 152 from North Rift, respectively.

5.2.1 User awareness on availability of e-resources

The focus group discussions revealed that 200(52.08%) out of 384 staff engaged in focus group discussions were unaware of the e-resources provided by the KRA library. These 200 included 100 staff from North

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Rift and 100 staff from Central regions respectively. The study revealed that most staff not aware of the e-resources had newly been recruited and had not been inducted into the KRA library program at the time of the targeted literacy program, contributing to a low level of awareness. Staff aware of the library e-resources were 184 (47.9%), i.e. 104 from North Rift (27%) and 80 from Central region (20.8%), respectively. However, post-literacy engagement survey results revealed that all 252 (100%) of the respondents were aware of available e-resources provided by the KRA library and that their interactions with the e-resources had greatly improved following the digital literacy training as projected in their interactions with e-resources access platforms below. These 252 respondents were 152 and 100 staff from the North Rift and Central regions.
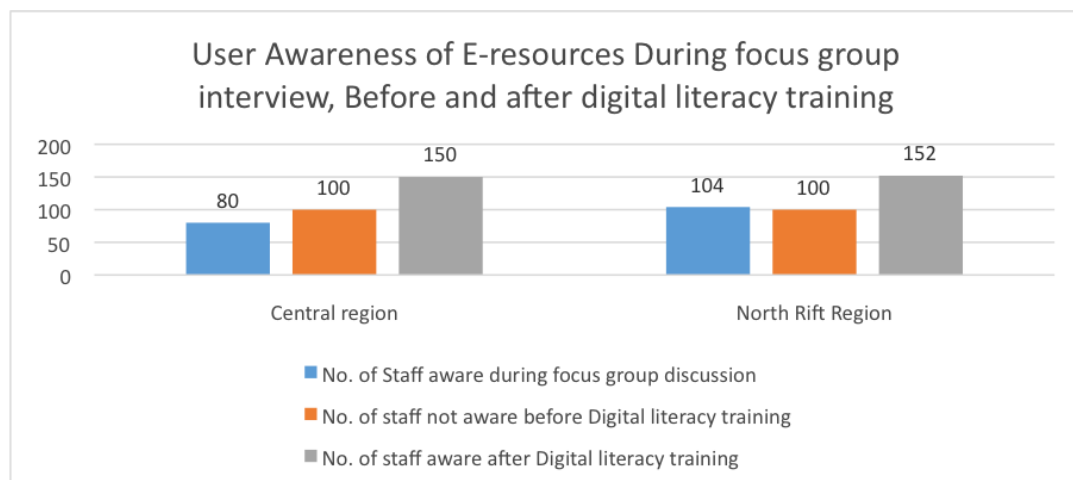
Figure 3: User awareness of e-resources before and after the digital literacy training

5.2.2 User access platforms for e-resources

The findings revealed that despite 200 staff (52.08%) not utilising resources from their unawareness, 38 staff (9.89%) were aware of the resources and had not utilised any platforms for e-resources access. On further probing, twelve of the 38 said they used other means like consulting peers and colleagues in fulfilling their information needs. In contrast, six of the other staff appreciated the provided e-resources, saying that not knowing how to access them was a hindrance, and they never bothered. The remaining ten said they had yet to develop a pressing information need and would consult as needed.

Table 3: Focus group discussion results on user access platforms for e-resource

Access Platform	No. of Respondents per Region N=384		Total	Percentage (%)
	Central	North Rift		
KRAHUB-Intranet	40	45	85	22.13
Remotexs-Remote access platform	24	35	59	15.36
KRA VPN Network	3	1	4	1
ALL	3	1	4	1
None	110	112	222	57.13%
Total	**180**	**204**	**384**	**99.89**

However, post-digital literacy training assessment questionnaires revealed a positive impact on the user interaction with e-resources on access platforms   as the 252 respondents provided feedback as shown in

the bar graph below:
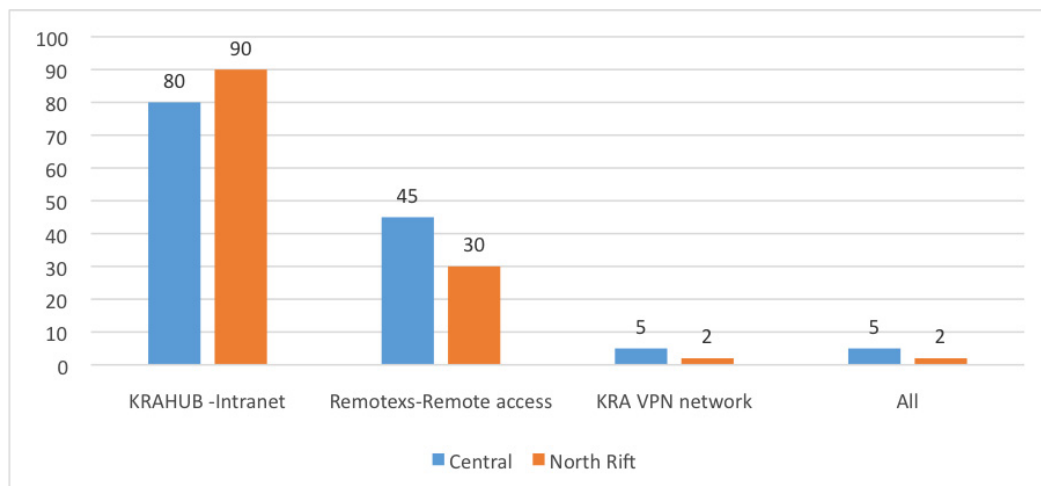
Figure 4: User access platforms for using e-resources since digital literacy training

The post-digital literacy assessment revealed that Central and North Rift staff accessed e-resources from multiple platforms (KRAHUB and Remotexs platforms). This is evidenced by reports that 170 staff (67.46%) in both regions used KRAHUB while 70 (27.77%) utilised Remotexs platforms, with a few staff accessing from all platforms since digital literacy sessions. Focus group discussions revealed that staff aware of e-resources utilised KRAHUB and Remotxs platforms, a concurrence revealed by the online questionnaire feedback.

5.3   E-resources databases used by KRA staff before and after digital literacy training

The focus group discussion revealed that staff used various databases for their research. Staff using the OECD (Organization for Economic Cooperation and Development) were still making references in Emerald and other databases, implying they were not limited to preferences. It is evident that staff interacted widely with the Online Library Public Access Catalogue (OPAC) before and after digital literacy training while utilising other resources, with Taylor and Francis's database taking the lead. Staff interaction with electronic databases increased greatly after the digital literacy training. The findings revealed that KRA staff preferred both e-journals and ebooks databases, with Taylor & Francis, JSTOR, OECD, and ProQuest eBooks scoring high in preference. The library mid-year confirms this FY 2023/2024 report, reporting a 20% resource usage index increase (KRA 2024).

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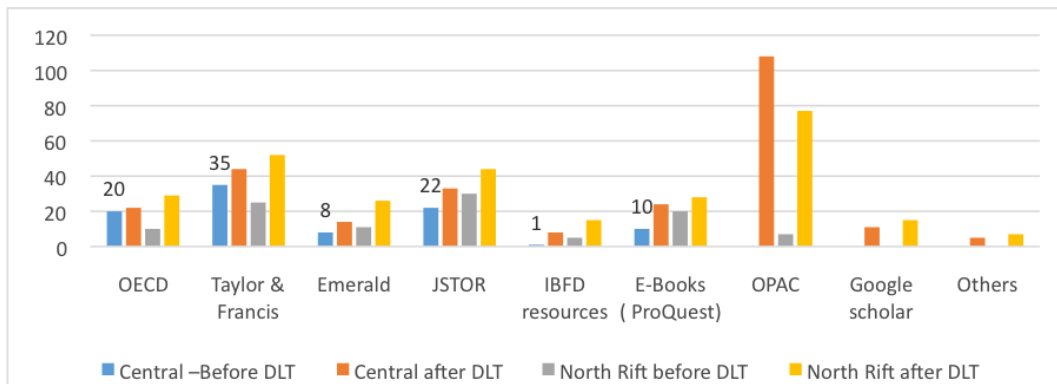
Figure 5: E-resources databases used by KRA staff

In an assessment to examine the impact of digital literacy training and awareness initiatives undertaken by the library in promoting e-resource utilisation, the study sought to determine the satisfaction level among KRA library users in North Rift and the central region.
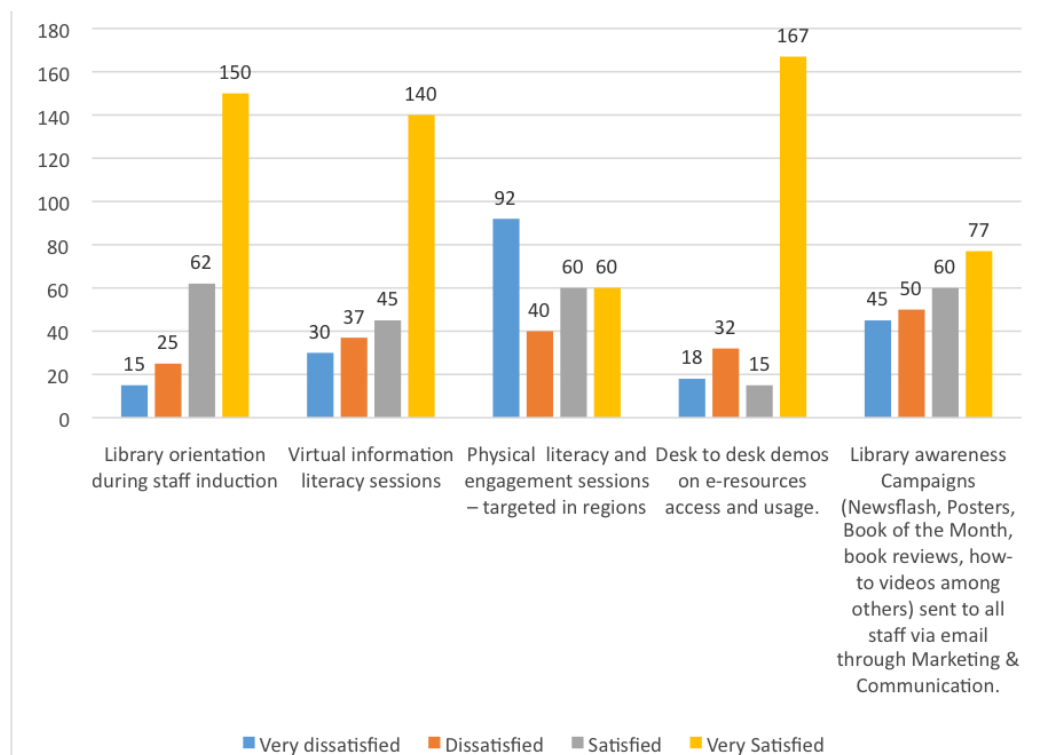
Figure 6: Effectiveness of the library awareness activities and digital literacy sensitisation training

The post-digital literacy results revealed that 120 staff (47.6%) of the respondents were satisfied with the Physical delivery of literacy sessions, while 67 (26.6%) were dissatisfied. The dissatisfied reported that they could not multitask during virtual engagement sessions and requested that the library team visit for live physical demos. Probably, these were staff stationed in Lodwar, Lokichgio, Kapenguria and the

central region where virtual sessions happened.   54.3% of the respondents positively perceived circulated awareness materials, implying the library should continue these initiatives.

5.4 Challenges and barriers faced utilising e-resources

Focus group discussion confirmed that KRA staff stationed in the regions, particularly North Rift and Central regions, lacked awareness of the availability of e-resources coupled with navigational search skills. In their recommendation, staff proposed quarter training and follow-up sessions and insisted that a professional reference librarian be assigned to the respective regions to provide support. Worth noting is that the Central region had no trained librarian, while North Rift, though having an established library, was served by student librarians in an internship program.

Following the revelation of unlimited navigational and search skills among staff, digital literacy training was delivered along with focus group discussions. Based on this, the study sought to determine how staff interacted with e-resources post-digital literacy programmes. This examined staff capabilities and whether the experience had improved or if the same challenges persisted.
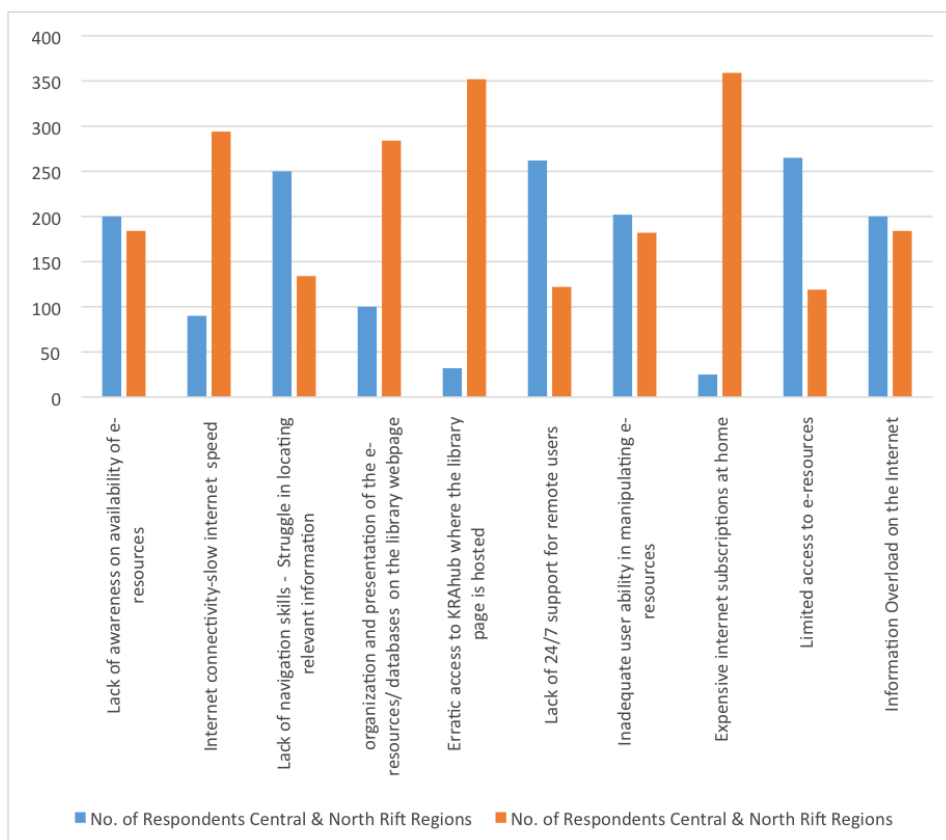
Figure 7: Challenges and barriers faced in utilising e-resources

The findings confirmed that e-resource access and navigation challenges had been resolved, with most staff reporting ease of access and confidence in navigation skills. However, in a telephone conversation with staff stationed in Suam –North Rift Region, staff confirmed that challenges with the erratic network on the KRAHUB intranet persisted. This was evidenced during focus group discussions as digital literacy

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sessions and demos of navigation practicals were interrupted by slow network connectivity. The post-evaluation report highlights a persistent erratic network challenge in Suam station, potentially attributed to fibre cables despite the optimal state of the KRA ICT infrastructure.
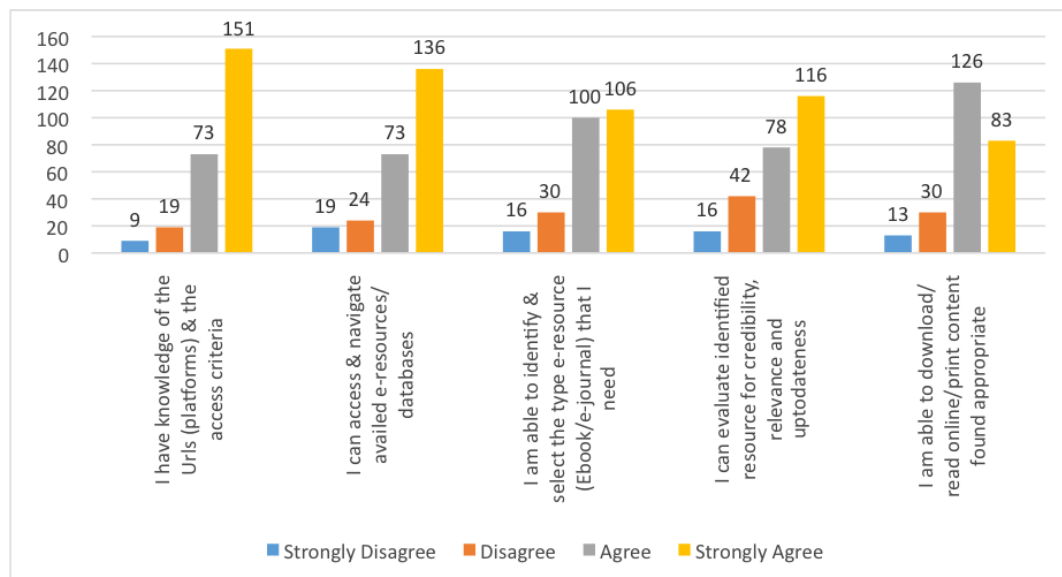
Figure 8: Post Digital Literacy Feedback- Online Questionnaire

5.5 Possible recommendations to mitigate challenges experienced

To address the reliance on virtual library utilisation through e-resources, staff suggested that the library team should focus more on physical literacy and user education programs rather than virtual initiatives. Additionally, staff recommended increased sensitisation across all levels to keep everyone updated on new developments, aiming to foster a reading culture among the staff. The report suggests a recap of the sensitisation process.

To ensure continuous learning and awareness, staff proposed making sensitisation sessions a regular occurrence, either quarterly or biannual, serving as refresher courses for the entire team. Furthermore, recognising the importance of the library's role, there is a call for establishing a librarian position in the region to enhance the efficiency and effectiveness of the available information resources.

In summary, the recommendations underscore the importance of physical literacy programs, regular sensitisation sessions, and the need for a dedicated librarian to address the challenges identified in the selected regions, fostering a more informed and connected work environment.
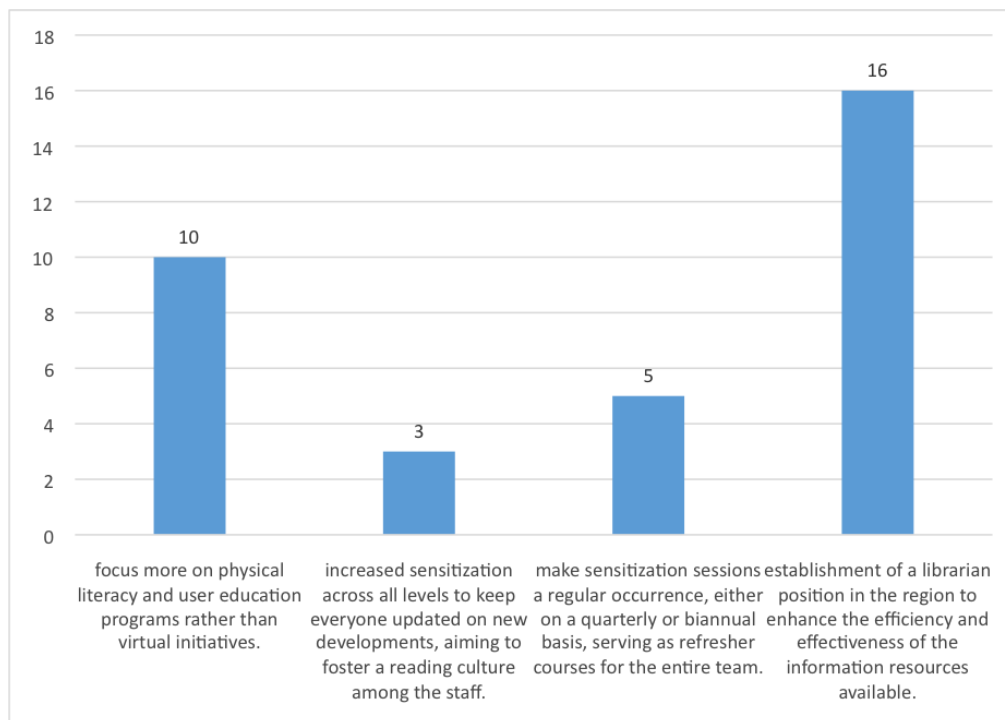
Figure 9: Recommendations to the challenges as proposed by library users and staff

6 Discussion of findings

The study, conducted as a post-digital literacy training assessment among KRA staff in the North Rift and Central regions, revealed a noteworthy level of awareness regarding the availability of library services, including e-resources. This positive outcome indicates the effectiveness of the awareness campaigns implemented after the digital literacy training. The phrase "what the mind cannot perceive, the eyes cannot see" emphasises that, despite the regular circulation of awareness materials via the KRA Communication office, staff in these regions might not have fully grasped the information. This underscores the crucial role of effective communication and awareness campaigns. The study suggests that even if resources are available, their impact may be limited if individuals are not well-informed or aware of their existence. The study recommends enhancing awareness through targeted communication strategies and outreach initiatives to address this.

Furthermore, the study established a significant correlation between digital literacy skills and electronic information resource utilisation. Notably, 90% of the engaged staff reported ease in accessing and navigating electronic databases. This positive outcome was reflected in the mid-year e-resources usage reports for FY 2023/2024, indicating a 20% increase in usage compared to the previous fiscal year (FY 2022/2023). The study infers that the combination of awareness initiatives and digital literacy sessions contributed to the increased interaction of KRA staff with e-resources during this period.

Based on these findings, the study recommends continuous improvement and increased targeted digital literacy sessions for KRA staff across all regions. This approach aims to sustain high digital literacy skills, adapting to emerging resources that may require new access navigational skills. By emphasising ongoing training, the study advocates for a proactive approach to ensure KRA staff can effectively leverage evolving technological resources.

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7 Recommendations

The study recommends a multifaceted approach to enhance staff engagement with e-resources at KRA, emphasising continuous improvement in awareness campaigns and digital literacy training. Targeted communication strategies and outreach initiatives are advised to ensure all staff members are well-informed about available resources. Continuous digital literacy training is essential to sustain high digital literacy skills, with sessions adapting to emerging technologies. Regular evaluations are proposed to assess the impact of these initiatives, guiding refinement for maximum effectiveness. Integrating awareness campaigns and training with organisational goals is encouraged to align staff development efforts with broader objectives. Additionally, partnerships with external entities are suggested to leverage resources and expertise, enhancing the quality and reach of digital literacy programs. In practice, Organisational policymakers, administrators and managers can leverage the study's recommendations to develop tailored awareness campaigns and digital literacy training initiatives, fostering a culture of continuous learning and innovation within their organisations.

8 Conclusion

Digital literacy and awareness play a pivotal role in bridging the digital divide gap and maximising the utilisation of e-resources. By equipping individuals with the necessary digital skills and knowledge about available resources, organisations can empower them to overcome barriers to access and effectively navigate digital platforms. This not only enhances individual productivity and learning outcomes but also fosters inclusivity and equal opportunities for all users, regardless of their background or level of technological proficiency. Through targeted awareness campaigns and continuous digital literacy training, organisations can narrow the digital divide gap and ensure everyone can benefit from the wealth of information and resources available in the digital age. Investing in digital literacy and awareness initiatives is essential for organisational success and for creating a more equitable and inclusive society.

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4. Awareness of Professional Ethics in the General Publishing Industry in Uganda

Joachim Bibuli*; Alice Gitta Kutyamukama**; Sarah Kaddu***

Makerere University

*joachyb@gmail.com; **alicekutyamukama@gmail.com; ***sarkaddu2@gmail.com

Abstract

This paper analyses the trends and developments in general publishing in Uganda. JSTOR, Library and Information Science Abstracts and Library, Information Science & Technology Abstracts, and journals such as International Information & Library Review, Library Management Journal, Electronic Thesis and Dissertations Repository, Oxford Journals and academic social networking sites including ResearchGate were used as the research data source. One hundred twenty articles were retrieved. Sixty articles were included after the screening. A content analysis approach was applied to analyse the articles. Publishing in Uganda can be traced back to the onset of colonialism. The early Christian missionaries majorly propagated literacy, books, and other publications, and the collapse of book publishing during Amin's reign gave rise to practices of cyclostyling and photocopying of pamphlets. A handful of associations, including the Uganda Writers Association, Uganda Printers Association, Uganda Publishers Association, Uganda Booksellers Association and Uganda Library Association, are associated with publishing activities in Uganda. Other industry players include editors, ethnographers, printers, book designers, typesetters, illustrators, and paper suppliers. These are primarily professionals who are dependent on publishers. Conclusion. The current legal framework, though not sufficient, can be an enabler for ethical practices that spur growth in the sector. Institutions such as the National Book Trust of Uganda (NABOTU), Uganda Library and Information Association (ULIA), Uganda Publishers Association (UPA), and editor's guild are integral to the dissemination of professional ethics and thus need to be supported in this endeavour.

Keywords: *Publishing, professional ethics, meta-ethics, descriptive ethics, prescriptive ethics, Uganda*

1 Introduction

Debates on ethical issues have gained prominence recently. Different societies, throughout history, have created their own ethical systems by which the members of that particular society are expected to live. Like any other industry, the publishing industry is guided by standards. The diffusion of new technologies and work methods has given rise to previously unheard-of practices. These two trends have influenced developments in the publishing industry. Ikoja-Odongo (2010) defines publishing as creating an information product from an idea developed into a manuscript, getting the manuscript processed, manufactured or printed and announcing the product in the market. Publishing is an economic activity, albeit with cultural significance. Ikoja-Odongo (2010) reports that the industry largely falls into broad categories of private and public sectors. He adds that the public sector, though small, is represented by The Uganda Printing and Publishing Corporation, Law Development Centre and Lands and Surveys, Makerere University Press and the New Vision Printing Publishing Corporation. The private sector is represented by Nation Media, Fountain Publishers, MK Publishers, Century Publishers, and Marianam Press, among others. Uganda Writers Association, Uganda Printers Association, Uganda Publishers Association, Uganda Booksellers Association and Uganda Library Association are some associations associated with the publishing industry. Today, unlike in the past, publishers can reach a sizeable number of readers with their products. Their revenue streams are, however, affected by the high levels of piracy and other forms of unauthorised use that pervade society. Given the multiplicity of players involved, awareness of ethics and adherence to ethical guidelines are thus crucial for the publishing industry.

Britz (2013) defines ethics as a branch of philosophy that studies human behaviour in terms of what is good or bad regarding relationships with themselves, others and their environment. He adds that ethical actions are neither self-evident nor obvious. Ethics refer to well-founded standards of right and wrong that prescribe what humans ought to do, usually regarding rights, obligations, societal benefits, fairness, or specific virtues. Capurro (2006) distinguishes between morals, ethics and law. He notes that morals refer to the customs and traditions of societies, while ethics are the critical reflection of these morals. Laws are those norms formally approved by governing bodies (local, national and international) and mostly reflect the morals of a given society. Ethics broadly fall into three categories: meta-ethics, descriptive, and prescriptive. For this paper, emphasis will be placed on prescriptive ethics. According to (Britz, 2013), Prescriptive ethics makes moral judgements about people's moral behaviour. Prescriptive ethics assumes that moral behaviour is based on a single rule (for example, you shall not steal) or a set of principles). Prescriptive ethics is subdivided into professional, personal, and social. Professional ethics focuses on the ethical issues relevant to professional relationships between people. The most common application of professional ethics is in the workplace.

This article aims to analyse the trends and developments in publishing in Uganda. The study's specific objectives were to analyse the trends and developments in Uganda, explore the legal and ethical framework governing the publishing industry in Uganda, identify the different stakeholders in the publishing industry, and explain the associated professional ethics that guide each stakeholder in the publishing industry.

2 Methodology

Information for this paper was collected through literature searches and document analysis. The articles were found by searching through databases such as JSTOR, Library and Information Science Abstracts and Library, Information Science & Technology Abstracts, and journals such as International Information & Library Review, Library Management Journal, Electronic Thesis and Dissertations Repository, Oxford Journals and academic social networking sites including ResearchGate. Books on publishing in Africa were also reviewed. The choice of database to search was based on familiarity with the author. More information was obtained by browsing the reference lists of the publications found.

3 Trends and developments in publishing in Uganda

According to Harrod's Librarians' Glossary (Harrod, 1987), publishing is the trade of publishing books, which includes negotiation with authors or their agents, design of books in conjunction with printers, book production, publicity and sales through booksellers and retailers. Mutula and Nakitto (2002) note that textbooks and imported trade books are the two main publishing sectors.

Tumusiime (2016) reports that publishing in Uganda can be traced back to the onset of colonialism. The early Christian missionaries majorly propagated literacy, books and other publications. He adds that in 1948 the East African Literature Bureau came into existence and promoted book development, especially in indigenous languages. Ikoja-Odongo (2010) notes that newspapers also provided an outlet for new knowledge and were used by the colonial government to create awareness. Furthermore, newspaper publishing in Uganda can be traced back to May 1900, when Mengo Notes was published. The next newspaper to be published was the Uganda Herald, which appeared in 1912 (Cook, 1936, pp. 27-46).

Bgoya and Jay (2013) posit that parastatal and independent Indigenous publishing houses came into existence in the 1970s. However, these were starved of government support due to the prioritisation of economic development. The publishing industry had to contend with inadequacies in legislation, duties, and taxes on industry inputs, as well as insufficient training centres for the industry's staff.

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According to Tumusiime (2016), the collapse of book publishing during Amin's reign gave rise to cyclostyling practices and photocopying pamphlets. Bgoya and Jay (2013) report that the 1990s witnessed the establishment of several important initiatives intended to strengthen African publishing, including the African Books Collective, the Bellagio Publishing Network, and the (now dormant) African Publishers Network (APNET), as well as the launch of the Zimbabwe International Book Fair. In Uganda, Crane Publishers and Fountain Publishers were established. Newspaper publications such as The Monitor (Now Daily Monitor) existed during this period. Favourable government policies that included privatisation of government businesses in the 1990s, including privatising publishing, the National Text Book Policy, the National Curricular Development Center open bidding system, the introduction of mother tongue instruction and engaging private publishers to publish curricular books contributed to the growth of indigenous publishers such as MK Publishers and Fountain Publishers (Ikoja-Odongo, 2010).

Despite the favourable government policy, the publishing industry, according to Mutula and Nakitto (2002), is plagued by a poor distribution network as a lack of access to adequate financial resources and a poor reading culture because Students (the majority population) read only for exams, not for pleasure or self-help. Additionally, unlike print books, oral culture is more animated, mixing dance, song, humour, and story-telling emotions simultaneously. Also, the increasing number of children is not matched by a corresponding increase in educational facilities and book supplies. Finally, there are 56 local languages in Uganda, but not enough writers, editors, and ethnographers to exclusively publish school textbooks and primary school readers for the lower primary curriculum.

The publishing industry in Uganda can be viable if the infrastructure and resources are sufficiently developed. Key issues must be prioritised, including adequate retail/bookselling infrastructure, increased funding for public libraries, and book donation programs that include African-published books rather than those exclusively produced abroad.

4 Legal and ethical framework governing the publishing industry in Uganda

The importance of a regulatory framework to guide the development, growth and utilisation/consumption of products in the publishing industry cannot be over-emphasised. The policies that govern the industry are outlined hereunder.

The Access to Information Act 2005 gives effect to Article 41 of the constitution by providing the right of access to information held by state organs, protection of persons disclosing evidence of contraventions of the law, and maladministration/corruption in government bodies. It also promotes transparency and accountability in all state organisations by providing the public with timely, accessible, and accurate information to enable them to scrutinise and participate in government decisions that affect them effectively.

The Copyright and Neighboring Rights Act 2006 protects articles, books, pamphlets, lectures, addresses, sermons, and similar works. Dramatic and dramatic musical works are also protected. However, protection is not extended to works made in the public interest, including Acts, reports by commissions, and daily news.

The Act states that for a work to be protected, it must be published in material form with the producer/publisher indicating the author, year of publication, title of work, name of/distinguish mark of the producer, and reservation rights of the producer under the Act. High levels of piracy due to ignorance of copyright relating to books, music, and films are critical barriers to publishing in Uganda.

The National Record and Archives Act 2001 provides for the rationalised management of government and other public records and archives under one authority to preserve, use, and dispose of such records. The Act also creates the National Records and Archives Agency.

The National Library of Uganda Act 2003 provides for establishing the National Library of Uganda, depositing and preserving publications, setting up an information referral service, and coordinating library operations. Other functions mandated by the Act include compiling and publishing a national bibliography of books published in Uganda to promote awareness of the availability of these books and allocating international standard book numbers and serial numbers to publishers in Uganda.

The Makerere University College (Deposit Library) Act 1958 required a publisher of every book published in Uganda to deliver a copy of the book to the librarian of the deposit section of the library within a month of publication. Makerere University Library has one of the largest legal deposit collections in the country.

The Depository Library and Documentation Centre Act (Uganda, 1969) made the Institute of Public Administration (Now Uganda Management Institute) another legal deposit centre. Kawalya (2008) reports that the legislation was passed to target documents from central government ministries, departments, and local governments since they did not comply with the 1964 law.

The Press and Journalist Statute 1995 regulates the freedom of the press, provides for the media council, establishes a National Institute of Journalists of Uganda (NIJU) and repeals the Newspaper Publication and the Press Censorship Act. It created the media council, the National Institute of Journalists of Uganda and a disciplinary committee within the media council. The council regulates media ownership eligibility and requires journalists to register with the National Institute of Journalists of Uganda.

Penal code sections 36, 37, 38, 39, and 39A deal with the importation of a publication into the country and the attendant penalties in case of contravention of the law. They also spell out the penalties for a person who publishes information regarding military operations strategies, troop location, or movement, among other things.

It is important to note that while policies go a long way in regulating the publishing industry, ensuring fair use of information, and respecting the rights of users and creators of information, they must overcome several challenges. These include, among others, the rapid technological advances, the absence of a coherent information policy, and problems relating to accessibility to information.

5 Professional ethics associated with each stakeholder

The diffusion of technology and global culture has given rise to an unprecedented thirst for money, fame and glory, which has resulted in the circumvention, suspension or abandonment of the ethical rules in the publishing industry in favour of practices that drive career advancement, product sales and revenue. These have inadvertently given rise to unethical practices such as fraudulent publication, plagiarism, duplicate publication and conflict of interest. The need to promulgate codes to guide professional practice and build a sense of identity cannot be overemphasised.

Ethics is a branch of philosophy that studies human behaviour in terms of what is good or bad regarding relationships with themselves, others and their environment. Ethical actions are neither self-evident nor obvious (Britz, 2013). Capurro (2006) underscores the importance of distinguishing between morals, ethics and law. Morals, he argues, refer to the customs and traditions of societies, while ethics is the critical reflection of these morals. Capurro (2006) adds that laws are those norms formally approved by governing bodies (local, national and international) and mostly reflect the morals of a given society.

Britz (2013) reports that ethics broadly fall into three categories: meta-ethics, descriptive and prescriptive. For this paper, emphasis will be placed on prescriptive ethics. Prescriptive ethics are anchored on ethical theories informed by certain principles and norms. Britz (2013) posits that prescriptive ethics is subdivided into three categories: professional, personal, and social. Professional ethics focuses on the ethical issues

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relevant to professional relationships between people. He adds that the most common application of professional ethics is in the workplace. Prescriptive ethics assumes that moral behaviour is based on a single rule (for example, you shall not steal) or a set of principles)

In Uganda, the legal framework sets the standards by which the different professions are expected to adhere. The Code of Conduct and Ethics of Public Service Uganda (2005), for instance, defines the professional code as the code that applies to a specific profession in the Public Service. The code prescribes the behaviour expected of public servants. Professional ethics in the code of conduct broadly falls into the broad categories of attendance to duty, time Management, absence from duty, sexual harassment, customer care, conflict of interest, financial credibility, communication of information, removal, destruction or altering of records, accountability, handling of gifts and bribes and dress and appearance.

The professional ethics laid out require professionals in the publishing industry to be beyond reproach. Ethical rules require a professional to be impartial and objective, manifesting the highest degree of integrity in conducting industry affairs. Ethical behaviour does not come naturally; humans must learn it. Thus, it is vital for publishing industry players to create awareness of the behaviour expected in the industry continually.

6 Conclusion and recommendations

Professional ethics' role in producing and disseminating knowledge cannot be overemphasised. The current legal framework, though not sufficient, can be an enabler for ethical practices that spur growth in the sector. Institutions such as the National Book Trust of Uganda (NABOTU), Uganda Library and Information Association (ULIA), Uganda Publishers Association (UPA), and editor's guild are integral to the dissemination of professional ethics and thus need to be supported in this endeavour. There is also a need to revitalise the Book Development Council to enable it to contribute to the growth of the publishing industry. Additionally, the National Library of Uganda, which is integral to the development of the ISBN and compilation of the National Bibliography, does not have the requisite resources to perform this role and thus needs to be supported.

This paper envisages a multi-pronged approach to addressing ethical issues in the publishing industry, including the government providing an enabling policy and legal environment for dealing with ethical breaches in the industry. This is particularly important for informal sections that form the bulk of the industry's ancillary services.

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5. The Use of Technology in the Preservation of Institutional Memory of Libraries

Lilian Gisesa
Kisii University
gisesalk@gmail.com

Abstract

Libraries are essential establishments in their organisations. While critical installations within the system are well documented, does the same apply to libraries? History informs decisions that are made, and the libraries are no exception. The learned experiences in the libraries should be passed on as changes occur to inform the transitions in these great assets of an organisation. This paper will look at how libraries in institutions manage their institutional memory, especially with the help of technology, to advise librarians to look at their concerns and support these great initiatives. Institutional memory helps to save time when new changes are being made, and some of it, if in tacit knowledge, may be lost forever if it is not documented.

Keywords: *Libraries, institutional memory, preservation, digital commons, DSpace, corporate memory*

1 Introduction

The twenty-first-century library is so much more than just about books. Libraries are regarded positively across the community, making them trusted reference points for information that may be sought across the institution. The diverse attractions of the modern public library are well known to regular users but little understood by non-users, including some of their most fervent supporters and many decision-makers. Libraries are often centrepieces of their communities.

University libraries have a similar symbolic value within their institutions, even when many academics and research students seldom need to go to the library building because their informational and documentary needs are met through the library's online subscriptions. However, existence value has diminished for special libraries in corporate environments, both business and government, as the resources have shifted online and modes of research and practice have changed. The library serves more than just being a custodian of books. There is quite a range of other activities that the library should undertake that are important in the institution, with preservation and dissemination of institutional memory being one of them.

2 Institutional memory

This is the knowledge, experience and expertise accumulated within an organisation over time. Institutional memory refers to the collective knowledge, experience, and expertise accumulated within an organisation over time. It includes the information, processes, best practices, and lessons learned that enable an organisation to function effectively and make informed decisions. It also includes lessons learnt to keep improving on the decisions made. The memories are visible in the institutions' buildings, furnishings, and atmosphere. They are enshrined in the collections, which embody the intentions of curators, the happenstance of collecting opportunities, and the interests of collectors.

Memory is also transmitted through staff methods, habits, and their recollections of colleagues and predecessors. Institutional memory takes the wider stage in community perceptions of institutions' roles and importance, perceptions that can condition support for institutions and understanding of their identities and 'brands'.

Institutional memory often lapses into such myth as stories are handed on from person to person, from generation to generation. Organisations should apportion the preservation of institutional memory upon the libraries within their establishments.

3 Libraries and preservation

Wilding 2014 argues that libraries should preserve everything. However, library collections are created through purposeful acquisition, serendipitous opportunity and chance. All library collections include the immaterial, the irrelevant and the unused; all library collections have gaps. Not all items in library collections are equal: some are of enduring importance, some of transient interest, some are sleepers that awaken to interest after languishing for extended periods, and some are and remain rubbish. Wilding is quite correct that political and moral judgements should not shape collections. However, the librarian's responsibility is to manage collections in accordance with the purposes of the library to preserve the precious, including the unacknowledged, but not preserve the transient, and help to obtain meaning out of aggregation.

4 Importance of preserving institutional memory

- Proper functioning - Organisations run well when their memory is well maintained. Institutional memory is like petrol for a moving car; functioning stops the moment it is not there. One piece of information leads to the making of a decision for another.
- Decision-making - Institutional memory aids decision-making by making historical information available to help with fast and proper decision-making.
- Time-saving - People don't have to think through decisions that have already been made, which saves a lot of time.
- Long-term success - This is guaranteed when Institutional memory is well preserved.
- Institutional continuity - A sudden loss of information can bring an institution to a halt since information is crucial in organisational processes. Preserving institutional memory avoids such eventualities.
- Learning and improvement - Institutions can only keep improving by learning from the past. Thus, the preservation of institutional memory is important.

5 Attributes of institutional memory that libraries should preserve

At the core of institutional memory lies the memory of the staff members who have worked, worked or will work in the institution. Some spend their working lives in the institution from early appointment to retirement; others come for a while and go, sometimes to return. Much of the corporate knowledge transmitted through the methods and habits of staff and their recollections of colleagues and predecessors is similarly reliable. It often consists of myth and legend handed from one staff member to another, distorted, sometimes exaggerated, sometimes imagined.

Corporate memory consists of the tacit knowledge of how things are done and recollections of previous experiences, including the 'hard cases', which both challenge and inform policy and practice. GLAMs include a deep understanding of the collections and programmes and, above all, of context. Context includes the fields of expression relevant to the institution and its collection, internal knowledge of the institution and its collection, and the continuing relationship with communities of interest – the creators, collectors, collections, vendors, audiences and broader community reception.

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Another facet of institutional memory is the public perception of an institution. The counterpart of staff memory, public memory, is shaped by visitors' and readers' experiences with the institutions and the casual views of the person in the street. It is thus partly shaped by the views of staff and how they interact with clients. In turn, public views influence the perceptions of staff, who are gratified by positive public feedback on the institution and encouraged to do better through criticism. Public memory tends to move slowly. Once established, the image of an institution, its role, and its reputation become crystallised and change with difficulty. This is well understood in brand management, in which practitioners attempt to invest their brand with positive values and dispel negative connotations, usually resulting in oversimplification.

For libraries, which are positively regarded across the community, the most challenging aspect of public perception to change is that they are just about books when the twenty-first-century library is so much more. The diverse attractions of the modern public library are well known to their regular users but little understood by non-users, including some of their most fervent supporters and many decision-makers. This is an enduring but not fixed responsibility as we work to ensure that we continue to capture and preserve the cultural expression – 'high' and 'low' – of today and tomorrow, as well as preserving and making available that of yesterday.

6 Repercussions of not taking care of institutional memory

i.   Loss
Institutions not keen on preservation lose many information assets, some of which cannot be reconstructed.

ii.   Re-inventing the wheel
When organisations keep re-inventing the wheel, valuable time is lost that could have been used to initiate other new projects.

iii.   Reduced efficiency
Wheel re-invention makes an organisation lose its efficiency in wasting time doing the same thing now and again.

iv.   Weakened organisational culture
Each organisation has its culture based on some fundamental principles of the founders. If the culture is good, it is extremely difficult to reconstruct when lost. When it is bad, it forms a basis for making it better.

v.   Stagnation and resistance to change
Change is inevitable as people, spaces and time evolve. Organisations can only advance well if they know their history well and improve on it.

7 Digital technologies and institutional memory

Digital technologies have brought many benefits, including the capacity to make materials much more readily available and in more easily useable formats. A book is not a library or a random accumulation of books. A library develops through building collections and services, creating physical and digital places, and involving people. As memory institutions, we not only look back to preserve the memories of the past and present but also look forward to the memory of the future. Our institutional memories should likewise energetically embrace our future, present, and past by using the available technologies to help preserve this. Although the advantages of digital technologies are great, like all new technologies, their introduction

brings challenges. One of the big challenges that Wilding identified is the restrictive practices of some publishers regarding e-books and e-journals.

Several products in the market preserve institutional memory. Therefore, an organisation must acclimate itself well with the core functions and find out as much information as possible about the available before deciding on its acquisitions. Some of these products include but are not limited to, Dspace, E-print, Etd, Digital Commons, Lockss, Digi tool, Content dm, and Archive-it.

These various dimensions of memory feed into a sense of ownership. People who never visit or use the institution may nevertheless value its existence and defend its continuation despite their lack of use and without any intention of using it.

8 The Role of the library in the preservation of institutional memory

i.   Coordination

The library department should coordinate institutional memory preservation initiatives within their institutions. They are the professionals who understand the importance of such initiatives.

ii.   Preservation

Preserving information assets is a part of librarianship training. This could be done through print, audio, visual, or audiovisual formats. The library department should advise their organisation on what information assets will be preserved and in which format.

iii. Training

The people responsible for Institutional Memory preservation initiatives should be trained and retrained to keep up with technological advancements in the preservation environment.

iv.   Resources

In addition to providing human resources through their training, Library professionals should request resources from their institutions to help them in preservation initiatives. These include financial resources, technological support, and training.

v.   Promotion

Continuous promotion of the importance of preserving institutional memory should be conducted so that members throughout the institution appreciate its role. This will help them provide support and information for preservation initiatives.

9 Guidelines for preserving institutional memory

Pan American Health Organisation outlines the following as guidelines for preserving institutional memory.

i.   Organisational culture

Preservation and use of Institutional Memory should be a component of the institution's organisational culture and play an essential role in decision-making.

ii.   Policies and procedures

The institutional internal policies, procedures, and working guidelines should include issues relating to information management and preserving institutional memory.

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iii.   Responsibility

The institution should define the unit responsible for monitoring, revising, and upgrading policies and procedures related to Institutional Memory. In this case, the library should be the reference point for those with libraries.

iv.   Methodology

Through guidance from the library, the institution should elaborate methodologies to deal with the different formats of the (tangible and intangible) institutional information produced and its level of access-secrecy and incorporate these methodologies into the administrative, technical, and strategic institutional routines.

v.   Platform

An open-code platform that also allows the storage of digital objects should be chosen because it gives the institution flexibility in its operation. There are quite a number of products in the market, and an institution should take time to explore diverse products before they settle on a product that can fit their needs as an organisation.

10 Conclusion

Institutional memory is crucial for any forward-thinking organisation. Libraries must lead in preserving their institutions' institutional memories. Several digital technologies are available to help on this front. Librarians should take a central role in sensitising their organisations to the importance of institutional memory preservation, with a clarion call to managers to support such initiatives for the posterity of their institutions.

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6. A Competency Index for Health Librarians in Kenya

Nelly Muhonja*;Tom Kwanya**

Kenya Medical Training College
nluyali@kmtc.ac.ke

**The Technical University of Kenya*
tkwanya@tukenya.ac.ke

Abstract

The COVID-19 pandemic exposed the soft underbelly of health libraries and information services in Kenya. With physical libraries closed, most information users turned to social media, whose credibility is unverifiable. An increased use of social media sources led to the spread of fake news, disinformation and misinformation. Of primary concern is how libraries and information centres are prepared to handle health crises and pandemics as regards the continuity of services. Of specific interest in this paper is the extent to which education and training of health librarians have prepared them to integrate proactivity in service delivery to the users. In light of this concern, this paper assesses the degree to which Library and Information Science (LIS) departments in Kenyan universities and colleges prepare librarians for effective health information service delivery. It examines the desired competencies of health librarians, analyses the degree to which existing education and training programmes deliver the desired competencies, identifies the gaps in the education and training of health librarians in Kenyan institutions, and proposes a competency index for health librarians in Kenya. The significant contribution of this paper is a competency index that the institutions can use to strengthen health librarians' education and training outcomes. Universities and colleges may use the findings to revamp health information aspects of their curricula. Professional associations can also use it to design programmes that bridge the gaps in health information service delivery. Similarly, policymakers may find the paper helpful in formulating guidelines for health information service standards in Kenya.

Keywords: *Health information literacy, infodemiology, infoveillance, LIS training, health librarianship*

1 Introduction

Libraries are fundamental in every society as gateways to knowledge and culture. They provide indispensable resources and services that create adequate opportunities for learning and research. White (2012) noted that libraries create "an authentic record of knowledge' accumulated across generations" (para. 1). Without libraries, advancing research and preserving accumulated knowledge and heritage essential to future generations would be difficult. Given the significance of libraries, and for the libraries to provide efficient services that guarantee unhindered access to knowledge, the human resources in our libraries should have relevant and sufficient professional competencies.

Health librarians play integral roles in their institutions. However, who is a health librarian? Lewis (2009) once wondered if working in a hospital library makes one a health librarian. As Ritchie (2018) explained, a health librarian is a "dynamic, innovative, techno-savvy, evidence-based practitioner with advanced health information skills, knowledge and attributes" who timely serves their clientele with the correct information whenever they visit libraries or libraries' websites (p. 4). They work in various institutions, such as medical libraries, hospitals, corporate libraries, and insurance companies. Their job responsibilities render them indispensable to their work settings. According to Gathoni (2021), they search for, select, and analyse information, a role that advances evidence-based medicine. In addition to providing access to information which improves the care of patients, they guide the public on how to find authoritative health information. They also design and conduct community outreach programmes through blogs and other social media

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platforms (SJSU School of Information, 2020).

Anwar and Zhiwei (2017) have reasoned that library professionals must have skills and competencies to make libraries meaningful to users. They further insist that "the library staff should own the new trends and paradigm shift to learn new techniques and tools", enabling them to satisfy the needs of library users (p. 22). This concurs with the view of the Federal Librarian Competencies (2008) that librarians require knowledge, skills and abilities to perform well. Skills are the ability to apply knowledge effectively in executing one's task (Anwar & Zhiwei, 2017). Competencies, on the other hand, according to Huling et al. (2017), are "consistent behaviours excellent performers exhibit effectively" (p. 206). A further view of concurrence is that competencies combine knowledge, skills and abilities that define and characterise professional performance (Barbara et al., 2008). However, for these knowledge, skills and abilities to be considered competencies, they must be qualities that can be observed, evaluated and rated. Only then will they provide a reliable yardstick for defining professional standards (Kwanya et al., 2012).

Many authorities and researchers have classified health librarian competencies into different levels and areas. According to Barbara et al. (2008), levels which indicate the amount of relevant knowledge or experience one has acquired in one's profession overtime are categorised into three: primary, which entails foundational knowledge and skills; advanced, which indicates significant knowledge evidenced in specialised skills and management expertise; and, expert, which involves extensive knowledge and skills proved by ability to, among others, use advance techniques and technologies to innovate, thereby, helping in making strategic decisions. Anwar and Zhiwei (2017) have grouped competencies into three areas which are: behavioural competencies, illustrated in problem-solving life skills, which comprise communication, analytical ability and initiative; functional competencies, which concern knowledge of one's roles (such as application systems development, networking and communication, database analysis and design) in the workplace; and, professional competencies, which make an organisation achieve its goals and include innovation, upholding professional standards and proper management of human resources. Still, other authorities have classified health librarian competencies into seven areas: foundation knowledge (knowledge of library and information science, critical evaluation of information); interpersonal skills (communication skills, decision making, initiative, marketing, mentoring writing skills); leadership and management (motivation of others to achieve excellence, financial and human resources management); collection development (collection and preservation of digital documentation and research data, records management); information literacy (numerical and data literacy, reference services, user guidance on accessing information); research and professional development (teaching, research publication, grant writing, developing qualitative and quantitative research methods) and, Information Technology skills (web technology, electronic resources management, web page development, database management) (CARL Competency Working Group, 2020; American Association of Law Libraries, 2020; Huling et al., 2017).

This research purposed to determine if training curricula for Library and Information Science courses deliver the desired competencies for the librarians and the kind of gaps in health librarians' education and training that undermine their competencies. The research also proposes how the gaps mentioned above can be abridged to realise practical training that improves the health librarians' competencies. Finally, the research aimed to discover health librarians' challenges in disseminating information to mitigate misinformation and disinformation during the health crisis, especially the COVID-19 pandemic.

2 Literature review

The literature review is structured according to the key themes in the objectives of this study. These are the role of LIS education and training curricula to impart appropriate competencies for health librarians, gaps in the education and training of health librarians, challenges health librarians face in the delivery of services during health crises to avoid disinformation and misinformation, and the appropriate competencies of health librarians.

2.1 LIS education and competencies of health librarians

Education is critical in moulding the capabilities of health librarians, providing them with the knowledge and skills they need to perform their crucial roles in the healthcare ecosystem (Giuse et al., 1997). Health librarians are experts who act as gatekeepers to the vast collection of medical data and information. They also make vital information resources more accessible to patients, researchers, healthcare practitioners, and the general public (McGowan, 2012). Access to appropriate education prepares health librarians to advocate for health literacy, bridging the knowledge gap between general audiences and sophisticated medical terminology (Sen et al., 2014). Ultimately, health librarians can translate medical concepts into understandable formats by refining their instructional and communication skills, enabling patients to make educated decisions regarding their health and treatment alternatives (MacDonald et al., 2010).

Health librarians also acquire creativity and adaptation skills, essential in an age of swift technological changes. Their training prepares them to use emerging technology and digital resources to improve information delivery and access (King & Lapidus, 2015). They also learn to promote cooperation and knowledge sharing among healthcare professionals and other stakeholders in the health sector (Noh, 2015). Health librarians also develop a lifelong commitment to professional growth and ethical practice due to their education. They gain experience navigating complex moral conundrums, such as protecting client privacy and confidentiality while advocating unrestricted information access (Mwaniki, 2018). One of the core components of their professional identity is their commitment to lifelong learning and involvement with changing trends and best practices (Maggio et al., 2015).

2.2 Gaps in the education and training of health librarians

Many scholars concur that commendable efforts are being made in the education and training of health librarians (King & Lapidus, 2015; Mwaniki, 2018; Noh, 2015). However, several gaps have been identified.

One of the most conspicuous of these gaps relates to digital literacy. In the face of rapidly changing digital technologies, many LIS programmes find it challenging to cope with the change. Therefore, they cannot fully cover the latest tools, software, and platforms relevant to health librarianship, leaving graduates potentially ill-equipped to leverage the full range of available resources (Butler, 2019; Rafi et al., 2019).

Health sciences is one of the sectors which generate vast amounts of data. Therefore, health librarians are expected to work closely with health informaticists to effectively manage and disseminate this health data. Chimah and Ezenwuzor (2023) argue that most LIS education programmes lack an adequate integration of health informatics principles. Bridging this gap would empower health librarians to contribute more meaningfully to data-driven decision-making processes within their healthcare organisations. Many scholars (Banks et al., 2005; Blake & Kouame, 2018; Capdarest-Arest & Navarro, 2021; Ma et al., 2018) advocate for the inclusion of health informatics in LIS curricula as a means of building the capacity of graduates to competently mine and disseminate health data to support evidence-based medical service delivery.

Diversity and inclusion is another area of concern. Many scholars (Martin, 2019; Mi, 2005; Mi & Zhang, 2017; Tucker, 2019) acknowledge that health librarians have to serve diverse populations with varying cultural backgrounds and health literacy levels. Therefore, LIS education programmes should incorporate training in cultural competency and diversity to ensure librarians can effectively engage with and meet the information needs of all users, regardless of their backgrounds or circumstances (Morgan-Daniel et al., 2023).

Interdisciplinary collaboration is becoming increasingly crucial in healthcare service and research. Health librarians typically work with multidisciplinary teams comprising physicians, researchers, educators, and administrators. Some scholars (Capdarest-Arest & Gray, 2020; Cooper & Crum, 2013; Kesselman & Watstein, 2009; Mi et al., 2022) point out that the development of interdisciplinary collaboration abilities, such as effective communication, teamwork, and project management, may not be sufficiently emphasised in educational programmes.

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Gaps might also be apparent in the coverage of the particular intricacies and complexities of healthcare information ethics and legislation, even though many LIS education programmes cover the fundamentals of ethical and legal issues in librarianship. Health librarians would be better prepared to handle these crucial challenges in practice if they focused more on subjects like patient privacy, data security, copyright law, and compliance with healthcare legislation (Ashrafi-Rizi et al., 2020; Larsen & Sinha, 2016).

It is imperative to tackle the deficiencies in health librarians' education and training to guarantee they possess the necessary expertise, abilities, and proficiencies to properly fulfil the constantly changing demands of healthcare information management. Collaboration is essential for academic institutions, professional associations, and healthcare stakeholders to create comprehensive and rigorous educational programmes that fit librarians' jobs and help them succeed.

2.3 Maintaining credibility in health information services

Health librarians are pivotal in the dissemination of credible health information. However, they encounter many obstacles in their fight against false and misleading information. Scholars have identified some of the challenges health librarians face while striving to maintain and promote the use of credible health information.

Increased proliferation of misinformation and disinformation in digital spaces is the greatest challenge against disseminating credible health information in this age (Herrero-Diz & López-Rufino, 2021). This is because, for many people, the Internet has become their go-to source for health-related information. Unfortunately, though it is a source of some reliable information, the Internet is also full of false information (De Paor & Heravi, 2020). It is difficult for health librarians to filter through the deluge of online content and find legitimate sources amid the disinformation (Sullivan, 2019). This task is challenging for ordinary information users who might be unable to tell fact from fiction (Bangani, 2021).

Another factor contributing to the growing prevalence of misinformation and disinformation is the ubiquity of social media platforms (Chisita, 2020). These platforms are becoming effective means of sharing health-related information but also as conduits of false information (Revez & Corujo, 2022). The fast dissemination of erroneous content on social media sites like Facebook, Twitter, and Instagram, which may quickly go viral and alter public attitudes and behaviours, is an enormous challenge facing health librarians (Young et al., 2021).

The generally low levels of health literacy among the populace also contribute to misinformation and disinformation. The general public varies significantly in their level of health literacy, and many people lack the ability to assess health information critically. Effective communication techniques and specialised educational activities are needed to help health librarians meet the task of empowering users to distinguish legitimate sources from unreliable ones and increasing health literacy (Paris et al., 2022; Stein-Smith, 2017).

Health librarians must take a multifaceted approach to tackling these issues, involving information literacy instruction, working with reliable sources and specialists, advocating for evidence-based practices, and continuing efforts to dispel false information and advance reliable sources in the healthcare sector.

2.4 Gaps in the literature on competencies of health librarians in Kenya

Compared to other locations, Kenya has comparatively less literature on the competency of health librarians. Firstly, comprehensive research focusing on the skills of health librarians in Kenya is lacking. Consequently, there is a lack of literature that particularly addresses the particular abilities needed for health librarianship in the Kenyan setting, despite considerable study on general library science and healthcare information management in Africa. Secondly, Kenya has no official competency frameworks or guidelines designed with health librarians in mind. The lack of such frameworks impedes efforts to create focused training programmes and professional development initiatives. This makes it difficult to evaluate the talents, knowledge, and skills necessary for effective practice in this subject. Thirdly, few documented case studies or best practices highlight effective health librarianship models in Kenya. Without such resources,

health librarians and healthcare establishments encounter difficulties duplicating efficacious approaches for information administration, distribution, and service delivery inside their own settings.

Researchers, educators, policymakers, and stakeholders in healthcare must work together to bridge these gaps in the literature regarding the competency of health librarians in Kenya. To improve the quality of healthcare information services that Kenyan communities receive, collaborative efforts to conduct empirical research, create competency frameworks, record best practices, and improve resource accessibility can help build the capacity of health librarians in Kenya. This paper contributes to bridging these gaps.

3 Research methodology

A research methodology refers to an investigator's techniques and procedures to identify and analyse information on a particular research topic (Sreekumar, 2023). It entails all particulars of research work such as research design, target population, sampling design, methods of data collection and the analysis of the collected data. This study used a mixed methods research approach involving the collection, analysis and interpretation of both quantitative and qualitative data (Kwanya, 2022).

A descriptive research design was used to establish the competencies of health librarians and the challenges they face. According to Voxco (2021), a descriptive research design is suitable for identifying, observing, and measuring the variables. Thus, information that describes a phenomenon, situation, or population is obtained systematically. In addition, it effectively characterises data and features about the population or phenomenon under investigation. The design was applied in all five institutions where the study was conducted.

The target population for this study was the health librarians and the heads of the identified institutions' Library and Information Science departments. It specifically consisted of full-time teaching staff members from the level of an assistant lecturer/tutorial fellow and above and librarians who were practitioners based at the selected institutions' libraries possessing diplomas and above. The population was stratified into two. The sample for this study was selected through the convenience sampling method. A total of 150 respondents were sampled. The number comprised health librarians (100) and heads of library and information science departments (50), as illustrated in Table 1 below.

Table 1: Sampling frame

Institution	Heads of Departments	Health Librarians		Sample percentage
		Total number	Sample size	
Kenyatta University	12	200	20	10%
Kenya Medical Training College	8	120	15	12.5%
Egerton University	10	180	30	16.7%
Daystar University	10	192	20	10%
University of Nairobi	10	158	15	8%
Total	50	850	100	11.8%

The research applied data collected from both primary and secondary sources. Primary data was collected using questionnaires which contained both open-ended and closed-ended questions. The questionnaires were split into two parts. The first part captured the extent to which the respondents were prepared to handle health crises. In contrast, the second part concerned how and if the education and training offered to health librarians is relevant in dealing with the challenges they face in their delivery of services. The questionnaires were self-administered. Questionnaires were preferred as they enable extensive population coverage within a short time and at a low cost. Questionnaires also give respondents adequate time to respond to the question items, and since they are also confidential, the collected data is more likely to

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be objective. The questions in the questionnaire were designed and structured in line with the research objectives. One hundred questionnaires were distributed (30 to the departmental heads and 70 to the health librarians).

In addition, interviews were conducted to supplement the questionnaires. The interviewed respondents consisted of 20 departmental heads and 30 health librarians. Some 40 respondents were interviewed face-to-face, while 10 were through the telephone. Interviews were equally fitting for this study. They enhanced interpersonal contacts and established rapport with the respondents. The researchers could also get clarification on unclear responses. Moreover, data was collected through bibliometric analysis of research-based articles published in various journals and magazines. These were sourced from the net websites.

All the questionnaires were scrutinised to ensure they were complete before the collected data could be analysed. The data was then coded and recorded according to the themes as reflected in the questions. The results were then described using the descriptive statistical analysis method, which involved the presentation of data using tables, graphs and charts – as well as commentary/discussion of the results. The interviews and the open-ended questions in the questionnaires were finally subjected to content analysis to achieve qualitative data. This involved classifying, summarising and tabulating the data.

4 Findings of the study

Response rate is essential in determining the validity of the findings for general inference. The response rate for this research is shown in Table 2 below.

Table 2: Response rate

Target population	Response		Percentage response
	Returned	Not returned	
Departmental heads	*26*	*4*	*87%*
Health librarians	*62*	*8*	*89%*
Total	**88**	**12**	**88%**

Eighty-eight out of 100 questionnaires were filled in and returned, reflecting an 88% overall response rate. This comprised 26 questionnaires out of 30 distributed to heads of departments and 62 questionnaires out of 70 distributed to the librarians. This depicts a response rate of 87% and 89%, respectively, for the heads of departments and the librarians. For the interviews, the target respondents were 20 for head of departments and 30 for the librarians. Due to some commitments, it was not possible to interview eight (three heads of departments and five librarians); hence, this gave a response rate of 84%.

4.1 Learning and research skills

Precisely 70 (80%) of the librarian respondents think their LIS diplomas and degrees have adequately prepared them for their work portfolio. In concurrence, 26 (or 60%) of the heads of department respondents affirm that the core curricula offer their students satisfactory training to render them valid in service delivery. Although many librarian correspondents think their training is adequate, only a paltry 20 (or 23%) are confident of their ability to conduct original research. The rest (77%) feel they need further training in research writing skills to enhance their competencies.

4.2 Proactivity during the health crisis (COVID-19 pandemic) and service continuity

Although libraries face challenges with resources, facilities and advanced technology, their leadership role is needed during health emergencies like the COVID-19 pandemic (Abdullahi, 2023). The study sought to determine the level of preparedness exhibited and the challenges experienced which undermined the

library's leadership role in disseminating information during the COVID-19 pandemic. The findings are illustrated in the table and pie chart below.

Table 3: Libraries challenges

Major concern	Frequency	Per cent
Lack of virtual library programmes	79	61%
Lack of database system	29	22%
Lack of public wireless access	13	9%
Lack of safety facilities (face masks, sanitisers, protective outfits)	10	8%

Table 3 shows that 61% of the respondents decried a lack of virtual library events and programmes in their institutions. This implies that institutions could not organise information and media literacy programmes to stem the spread of fake news about the coronavirus. Of note is that a sizable number of institutions (22%) lacked functional database systems; hence, they could not maintain general information and statistical data on the COVID-19 pandemic from other parts of the world for future reference. Neither could they facilitate distance learning and working-from-home arrangements. However, many institutions could provide free Wi-Fi and safety facilities since only 9% and 8% reported the lack of those in their institutions.

4.3 Further training for capacity building

Obasola et al. (2014) have reported that, through workshops, librarians can be empowered with knowledge and new skills required to support teaching, learning and research in the African continent. The study also interrogated whether the respondents have undergone workshop training for capacity building. Table 4 presents the findings.

Table 4: The last time respondents attended training workshops

Training period	Frequency	Percentage
Six months ago	16	18%
One year ago	18	21%
Two years ago	19	22%
Over two years ago	29	33%
Never	5	6%

Table 4 shows that several respondents, 29 or (33%) attended a workshop more than two years ago, 22% two years ago, 21% a year ago, and 18% six months ago. Five respondents (6%) had never attended any workshop training. The respondents received training in five major areas: research writing skills, Internet services, budgeting and advocacy for funding, proactive librarianship, and preparing online databases. All the respondents agreed that the knowledge gained from workshops was essential and should be applied in their places of work.

4.4 Availability of digital information resources

The study sought to determine whether digital information was in use and what digital information resources were available in their libraries. The findings are presented in Table 5 below.

Table 5: Types of digital information resources available

Digital information resources	Frequency	Per cent
E-Newspapers	20	15.4%
E-Books	23	17.5%

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Digital information resources	Frequency	Per cent
E-Readers	18	14.2%
E-Journals	13	10.0%
Mobile information literacy	4	3.1%
Internet services	17	14.0%
E-Learning tutorials	5	4.2%
E – Thesis dissertations	10	7.6%
Online database	5	3.5%
Online search engines	12	9.6%
Kio kit	3	2.1%

Table 5 shows that various digital information resources were available in the sample institutions. However, they are inadequate, as suggested by the low frequencies and corresponding percentages. Most respondents acknowledged that E-Books, E-Newspapers and E-Readers were readily available with 23, 20 and 18 frequencies, respectively. The last available were the Online database, Mobile information literacy and Kio kit, with frequencies of 5, 4 and 3, respectively. This indicated low levels of Information Technology investment in the institutions.

4.5 Training of respondents on the use of digital information resources

The study sought to establish whether the respondents had been trained to use digital information resources. A more significant number (62%) agreed they had been trained to use digital information resources, while 32% reported that they had not been trained. The study enquired further about the type of training they have received, and the results were as follows.

Table 6: Types of training offered to respondents on digital information

Area of training	Frequency	Per cent
Computer literacy	49	56%
Search and retrieval	39	45%
Use of e-reader	37	42%
Accessing e-resources	59	68%
Using e-learning platforms	15	17%

Much training has been offered in accessing e-resources and computer literacy, as indicated by 68% and 56%, respectively. In comparison, search and retrieval and use of e-readers have received moderate training (45% and 42%, respectively. The respondents have been trained the least in e-learning platforms (17%), which is a worrying concern.

4.6 Unreliability of digital information services

The study also investigated the reliability of the available digital information services. The findings revealed that of the 87 respondents who reported the availability of digital information services, 50 (57%) indicated that digital information services were unreliable. Only 37 (43%) said the services were reliable. This accounted for the low frequency of using digital information services in universities and colleges. This unreliability of digital information services is of great concern since, according to Nakitare et al. (2020), current library users are tech-savvy and prefer to access information resources remotely through digital platforms. This suggests that librarians need to be tech-savvy to be satisfactorily sufficient in meeting the needs of their clientele.

5 Competency index for health librarians

There is a need for health research visibility, relevant and adequate medical education, quality health care, and well-being in the digital age – and health librarians play a central role in all these. Of note, AHILA (2020) has asserted that health research visibility is enhanced by research, which also solves practical problems and adds to the body of knowledge. It is, therefore, imperative that health librarians possess satisfactory professional competencies.

Many library organisations, scholars and librarianship researchers have created competency indexes for health librarians to guide educators and employers on what to expect from their potential information professionals. However, as Alenzuela et al. (2020) have asserted, no competency index created by any organisation can be "a one-size-fits-all" given that libraries are unique based on geographical background, cultural background, language and other factors such as availability of financial resources (p. 59). Therefore, there is still a need to develop a competency index for Kenyan health librarians that would appeal to the uniqueness of Kenyan college libraries.

Based on this study's research findings, after analysing collected data and bibliometrics, the researchers have developed the following competency index for Kenyan health librarians, which is believed to be suitable for the Kenyan situation.

Table 7: Proposed competency index for Kenyan health librarians

AREA	COMPETENCY AND SKILLS
1	**Professional Knowledge Competencies**
	a) Foundational knowledge • A professional training background in library and information science. • An understanding of the theory of librarianship and information management. • Proficiency in library operations, policies and procedures. • Familiarity with information literacy and its standards. • Familiarity with medical concepts and terminology • Familiarity with medical education goals at different education levels. • Familiarity with critical medical databases.
	b) Acquisition of resources • Familiarity with different methods and procedures of acquisition of prerequisite resources. • Familiarity with a selection of both traditional and electronic medical resource tools. • A knowledge of experts and authors in the field of medical sciences. • A knowledge of how to order and supply medical resources. • A knowledge of how to maintain and conserve medical resources. • Certainty of how to use e-commerce for medical acquisition.
	c) Information access • Ability to retrieve information from all library sources. • Ability to use medical bibliographic databases. • Ability to use medical resources portal. • Ability to use traditional and modern searching tools for information services.
	d) E-resources management • Familiar with rules of cataloguing and standards of bibliographic format. • Familiarity with printed, non-printed, and electronic medical resources. • Able to teach users about how to use medical reference sources. • Able to index medical resources. • Able to write medical abstracts articulately.

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AREA	COMPETENCY AND SKILLS
	e) Research and publication • Familiarity with research methods. • Ability to use quantitative and qualitative research methods. • Ability to design research hypotheses and questionnaires. • Ability to write proposals and conduct research projects. • Knowledge of grant writing to pursue grants to facilitate research work. • Ability to use data analysis application software. • Ability to use reference application software. • Knowledge of research ethics in the practitioner, researcher and service roles.
2	**Personal and Interpersonal Competencies**
	a) Personal attributes • Adaptability, flexibility and enthusiasm for new challenges and experiences. • Ability to have creative thinking. • Problem-solving ability and sound judgment are required to come up with solutions. • Ability to solve conflicts and disagreements in constructive ways. • Innovative ability to design new methods and procedures to complement the established ones. • Commitment to lifelong learning and career development. • Knowledge and commitment to professional ethics and values.
	b) Communication and public relations • Proficiency in both oral and written communication. • Ability to communicate effectively with the clientele. • Ability to share knowledge and experience with colleagues. • Ability to use computer communication skills such as chat, e-mail and fax. • Ability to interact mutually with colleagues. • Ability to negotiate confidently and persuasively. • Ability to promote library products by way of marketing.
	c) Leadership and management • Ability to run the library effectively. • Ability to codify regulations and formulate policies. • Capability to set goals and outline their implementation strategies. • Capability to inspire and empower others to strive for excellence. • Aptitude to make decisions proactively. • Ability to understand the principles of effective personnel practices and human resource development. • Ability to successfully plan, organise and manage resources to complete specific project objectives within a certain time frame. • Ability to source for funds and manage the budget. • Capacity to assess library performance in service delivery both qualitatively and quantitatively.
3	**Technology Competencies**
	a) Core technology • Conversant with the operations of ICT hardware such as computers, printers, photocopiers, scanners and digital cameras. • Ability to configure and troubleshoot basic technology hardware such as computers, printers, scanners and photocopiers. • Conversant with audio and video capturing, editing and publication. • Ability to install and configure basic operating systems and applications. • Ability to install and update basic ICT security systems such as the antivirus utilities.

AREA	COMPETENCY AND SKILLS
	b) Information Technology • Knowledge of posting and updating content on social media platforms such as Twitter, Facebook, blog, Slideshare, and MySpace. • Knowledge of basic structure, content and use of an integrated library system (ILS). • Conversant with emerging web technology such as online social networking tools (Twitter, Facebook, MySpace). • Conversant with acquisition and management and accessing digital resources. • Understanding of principles of web page design and maintenance. • Understanding the structure and use of the campus learning management system (LMS) is essential. • They understand how databases are designed and structured for convenient data and/or information retrieval.

6 Conclusion

The study findings have revealed that libraries are insufficient in providing information resources to their users, though some have made great strides in improving the prerequisite infrastructures. Despite astronomic growth – in terms of campuses, programmes offered and student enrolment – witnessed in Kenya's institutions of higher learning over the years, there are inadequacies in library resources, especially in e-library infrastructure. The libraries experience budget deficits, hampering the acquisition of adequate information resources. Inadequate information resources and underdeveloped technological infrastructure cause user dissatisfaction. The implication is that more technological training must be advanced for libraries and health librarians to offer quality services. The author has developed a competency index for health librarians, which can only be applicable if service set-up is in place to align job responsibilities, technology requirements, necessary equipment and management policies. The lack of these is a significant cause of insufficient operating capacity and management systems. The study findings have also revealed the discontentment of the health librarians with their work environments. Their dissatisfaction stems from rare training opportunities, uncoordinated organisational communication and unfair remuneration: they also feel their job security is at stake. All these are gaps that compromise quality services.

7 Recommendations

- For the Kenyan universities' health libraries to effectively provide services that adequately meet the needs of the users, this paper proposes the following guidelines and recommendations:

- Curriculum developers for health librarian courses should redesign curricula and training strategies to meet new user demands by incorporating new pedagogical and adaptive technologies that integrate new systems such as e-learning and e-portfolios. As Fernández-Luque et al. (2021) have reported, information professionals should play a crucial part in designing such training programmes for this to be successful.

- Governments and stakeholders in the higher education sector should equip university and college libraries with ICT technologies such as mHealth and Makerspace to support medical education. In concurrence, AHILA (2020) has pointed out that using mHealth in patient monitoring, mobile telemedicine, electronic data collection and tracking epidemic outbreaks will considerably support medical education. This would complement the virtual library programmes already provided by some universities.

- Libraries' capacity development to respond proactively to COVID-19 and any epidemic should be encouraged and provided regularly. Health librarians can do this by engaging in collaborative research with other health research institutions on the African continent.

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- Institutions should provide further and regular capacity-building training through workshops and seminars. This training can be done with other institutions to enhance information and knowledge sharing.

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7. The Awareness of Copyright Laws at the University of Venda Library

Maropene Thomas Ramabina*; Zawedde Nsibirwa**

University of KwaZulu-Natal

*maropene.ramabina@nwu.ac.za

ORCiD 0000 000202685 3912

**nsibirwaz@ukzn.ac.za

ORCiD 0000 0001 8527 1560

Abstract

Academic libraries are essential for universities as they facilitate research, teaching, and learning. They have many copyrighted information from print to electronic resources such as books, eBooks, journal articles, theses and dissertations, online newspapers, and database subscriptions, including law reports and legislation. Library staff and users face many copyright questions, from copyright ownership, copyright limitations, and fair use to copyright licencing agreements and textbook digitisation. Library staff need to know what they can or cannot do with each piece of work they consult. A poor understanding of copyright can lead to copyright compliance problems. Using conceptualisation and Social Responsibility Theory, the study on which this article is based investigated the awareness of library staff of copyright laws at the University of Venda (UNIVEN). The population consisted of 38 library staff selected using a census sampling method. The study used a quantitative research approach and collected data using Google Forms. The results show that the UNIVEN library staff was reasonably familiar with essential copyright matters. However, they can benefit further by attending regular intellectual property (IP) or copyright training. The study recommends, amongst others, that the UNIVEN Library develop a copyright policy and that the UNIVEN copyright officer have regular copyright workshops with the staff.

Keywords: *Copyright, intellectual property education, social responsibility theory, digital rights*

1 Introduction and background

Academic libraries support the mandate of their institution in teaching, learning, and research by providing comprehensive information services to its students, staff, and outside communities. The library has copyrighted information from print and electronic resources, such as books, eBooks, journal articles, law reports, legislation, theses and dissertations, online newspapers, and database subscriptions. All these resources are protected by copyright law. Library staff must ensure that users use the materials without violating copyright law. Users must know under what circumstances a copyrighted work can be used without requesting permission from the rights holders. In addition, library staff need to know what users can or cannot do with copyrighted works. However, users do not readily understand the content of licenses, and the contents of the licence may not be easy to access (Fernández-Molina et al., 2017). Library staff must have adequate copyright knowledge to guide and provide relevant advice to library users.

2 Methodology

Research methodology is where the researcher provides various steps adopted in the study to address the research problem and its logic (Kothari, 2004). The study used a quantitative research approach using a survey for data collection. A questionnaire with predominantly closed questions was designed and distributed to library staff. The study adopted a census sampling approach. All 40 UNIVEN Library staff, from library assistants to the director, were approached to participate. Thus, no distinction was made between seniority, qualifications, and library staff positions. As pointed out, all library staff should know

about copyright because it affects every area of the library services (Norris et al., 2019). As providers of information, librarians and library staff are among those who are expected to be responsible for enforcing IP rights and regulations in their libraries (2010).

Due to COVID-19 protocols at UNIVEN, online questionnaires using Google Forms were used to collect participant data. WhatsApp, a widely used social messaging platform (Coleman & O'Connor, 2019), and email sent the participants a link to Google Forms. Respondents were given three weeks (from 13-31 December 2021) to complete the questionnaires, and three reminders were sent to the library staff in the WhatsApp group. An experienced researcher in the IP field evaluated the questions in the instrument in terms of how comprehensive and accurately they covered the concepts being researched. Additionally, the instrument was pre-tested using subject librarians from the University of KwaZulu-Natal. Based on these processes, some questions were adjusted to help ensure validity and reliability. The response was excellent, with 38 of the 40 library staff participating, yielding a response rate of 95%.

3 Research results and discussion

The research findings summarise primary responses and demographic profiles, including age, gender, and educational level (Nsibirwa, 2012).

3.1 Background information of the participants

The data in Table 1 show that 23 participants (60.5%) were female, while 15 (39.5%) were male. This means there are more female than male staff at the UNIVEN Library. The highest number of participants were between the ages of 41-50, with 18 (48%) indicating that they fall into this age group. These experienced library staff have worked in libraries long enough to understand copyright issues. The age group with the least respondents was the 20-30-year group with two (5%) respondents. There was no respondent over the age of 60. Regarding education, 11 (29%) respondents had a degree, and the highest educational qualification was a PhD, with two (5%) respondents. Four (11%) respondents had the lowest educational qualification, a matric.

Most respondents were generally formally well-educated, with 89% having some form of tertiary qualification. This suggests that most UNIVEN Library staff are educated and should have good copyright knowledge. Regarding job titles, 15 (39.5%) respondents were Library Assistants, while the next highest number, 11 (29%) were Information Librarians. As seen in Table 1, the remaining respondents had a variety of job titles. The only job title held by more than one respondent was Chief Library Assistant, held by two (5.3%) respondents.

Table 1: Demographic information

Variables Participants	Frequency	
Library staff (N=38)		
Gender	Male	15 (39.5%)
	Female	23 (60.5%)
Age group	20-30	2 (5%)
	31-40	10 (26%)
	41-50	18 (48%)
	51-60	8 (21%)
	Over 60	0
Library staff qualifications	Matric	4 (11%)
	Diploma	7 (18%)
	Degree	11 (29%)

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Variables Participants	Frequency	
	Honours	7 (18%)
	Masters	6 (16%)
	PhD	2 (5%)
	Other	1 (3%)
Library staff job titles	Library assistant	15 (39.5%)
	Senior library assistant	1 (2.6%)
	Chief library assistant	2 (5.3%)
	Information librarian	11 (29%)
	Executive Secretary	1 (2.6%)
	Senior Administrative Officer	1 (2.6%)
	Cataloguing librarian	1 (2.6%)
	Periodical librarian	1 (2.6%)
	HoD	1 (2.6%)
	Intern	1 (2.6%)
	Non-response	3 (8%)

3.2 Awareness of South African copyright legislation

The authors wanted to know if participants knew of the South African Copyright Act and the CAB, and Table 2 displays the findings. Twenty-nine (76.3%) respondents indicated that they were aware of the existence of the South African Copyright Act, while 19 (50%) participants stated that they were aware of the CAB. The study findings agree with Charbonneau and Priehs' (2014) study, which found that most academic librarians, library administrators and library staff were familiar with copyright legislation, in this case, the US Copyright Act of 1976, fair use, Creative Commons licencing, and the Technology, Education and Copyright Harmonisation Act of 2002.

Most library staff (29; 76.3%) participated in the library orientation programme for first-year students, in which copyright issues were covered. Information librarians offer database training and information literacy courses such as Introduction to the Theory of Law (INT 1141), Foundation Information Technology (FIT 1140/FIT 1540), Nutrition Orientation (RNT 1141) and Entrepreneurship (ENT 1140). These courses are offered for foundation and first-year programmes, and copyright issues are covered in the content. These programmes help confirm that academic libraries play a role in copyright matters on their campuses (Charbonneau & Priehs, 2014).

The University of Fort Hare (UFH) discovered similar findings: the library provides users with an information literacy training programme covering copyright issues (Mzayiya, 2016). Ercegovac and Richardson Jr (2004) argued that one way to promote copyright is through a systematic information literacy programme, including IP issues in its syllabus. The library must make these programmes mandatory and credit-bearing to encourage and measure good student attendance. Library staff participation in the orientation and information literacy courses could have increased their copyright knowledge since they must research the topic. The UNIVEN Library has an office for Interlibrary Loans (ILL), which assists in getting materials unavailable at the UNIVEN from other academic libraries. The library staff in this office attend regular workshops for ILL organised by the Library and Information Association of South Africa (LIASA) and SABINET, and copyright is always covered in these sessions. Studies by (Adler et al., 2010) and Sims (2011) found that library staff had a robust understanding of copyright principles, especially fair use.

Library staff were asked about their knowledge of the CAB, and the findings revealed that half of the participants (19; 50%) stated that they were aware of the CAB. It is worrying that some library staff are

working in an environment dealing with copyright information, yet they have never heard or seen the Bill. These library staff were not aware of the existence of the Bill, which was established in 2018 with much fanfare. This finding indicates that library staff do not cover the CAB in their library orientation, database training, and information literacy courses. They could be focussing on what they were told or taught about the Copyright Act and unaware of the CAB. Given this, more comprehensive training is warranted to help increase awareness of the CAB. Oppenheim and Woodward's (2004) study found that librarians from academic libraries needed more training on copyright matters. Nilsson (2016) pointed to a lack of general knowledge of copyrights and, as noted, recommended focusing on copyright issues in the LIS curricula.

Table 2: Awareness of South African copyright legislation   N=38

Copyright legislation	Aware of it		Heard of it		Not aware of it		Non-response		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
South African Copyright Act	29	76.3	7	18.4	2	5.3	0	0	38	100
Copyright Amendment Bill	19	50	7	18.4	10	26.3	2	5.3	38	100

3.3 Awareness of general copyright issues
Table 3 reflects the findings related to the respondents' awareness of various copyright issues.

Table 3: Awareness of general copyright issues   N=38

Variables	Aware	Not aware	Unsure
What does copyright law in South Africa protect?	27 (71%)	6 (16%)	5 (13%)
Duration of copyright law	16 (42.1%)	4 10.5%)	18 (47.4%)
Public domain	23 (61%)	7 (18%)	8 (21%)
Limitations and exceptions of copyright law	51 (134%)	15 (32%)	1 (2.6%)
Fair use	21 (55.3%)	10 26.3%)	7 (18.4%)
Familiarity with copyright licensing on online materials	16 (42.1%)	12(31.6%)	9 (23.7%)
Copyright violations in the library	24 (63%)	14 (37%)	-
Organisation responsible for granting permission for one to use a copyrighted work	29 (76%)	3 (8%)	6 (16%)
Frequency of dealing with copyright-related issues or queries at the workplace	28 (74%)	10 (26%)	-
Legislation covering copyright issues in the digital environment	6 (16%)	8 (21%)	24 (63%)
Availability of copyright policy	4 (10%)	22 (58%)	12 (32%)
Copyright training/workshops for library staff	5 (13.1%)	12(31.6%)	21 (55.3%)
Availability of copyright officer at the workplace	17 (44.8%)	8 (21%)	13 (34.2%)
Copyright ownership	45 (119.1%)	-	12 (31.5%)

A clear majority of library staff (27; 71%) knew that copyright law protects ideas that have been expressed and recorded (UNESCO, 2010; DALRO, 2021), with six (16%) not aware and five (13%) unsure. Almost half of the respondents (16, 42.1%) knew that the duration of copyright on library materials in South Africa is the author's lifetime and 50 years after the author's death. Four (10.5%) were unaware, while 18 (47.4%) were uncertain about the duration of copyright. The duration of copyright law is one of the most critical and practical ways of creating and maintaining a balance between the interests of copyright owners to receive fair compensation for their efforts (Nicholson, 2012). It was clear from the findings that UNIVEN library staff understood the public domain and knew what it meant, with a majority (23; 61%) saying that the public domain means the work can be used freely without obtaining permission from rights holders. Seven (18%) were unaware of the public domain, while eight (21%) were unsure about the correct answer. Knowledge of the public domain would assist library staff in advising library users accurately

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about whether the work is still protected. If the work is no longer protected, it means that library users can use it without any restriction or need to request permission to do so.

Since copyright law gives authors and creators a statutory monopoly over their creations, limitations and exceptions are critical for equal rights distribution (Nicholson, 2012). Judging by participants' choices regarding their knowledge about the exceptions and limitations included under South African copyright legislation, it can be assumed that library staff knew and understood copyright limitations per the country's copyright law. Most participants chose the exception of teaching, research and libraries (21; 55.2%), and private copying and criticising someone's work (18; 47.3%). However, 15 (39.4%) respondents incorrectly stated that a limitation included in the law is copying for commercial purposes.

Libraries, archives, and patrons have fair use rights under South African copyright law and international copyright agreements, including the Berne Convention. The findings indicated that just over half of the library staff (21; 55.3%) understood fair use. Ten (26.3%) participants knew nothing about fair use, while seven (18.4%) were unsure. Library staff must be aware of the exceptions and fair dealings (especially for educational use), whereby permission is not required from the copyright owner to use particular works (Polak, 2009). Library staff were also found to be familiar with copyright licencing on electronic materials and copyright violations in the library. They also knew that the DALRO is the South African organisation responsible for granting permission for one to use a copyrighted work. A worrying statistic was that of the 38 participants, 24 (63%) indicated that they were unsure about legislation that addresses copyright in the digital environment.

Furthermore, most library staff (22; 58%) did not know whether their library had a copyright policy. It was also surprising that 21 (55.3%) of library staff were unsure if copyright workshops are organised on campus. The number is surprising because the university organises IP workshops on campus through the Directorate of Research and Innovation, and some library staff are covering copyright issues during library orientation programmes and database training. Thus, many library staff are unaware of the training being offered on campus, which points to the need for better advertising of such training.

Half of the library staff indicated they do not have a dedicated copyright person on campus. This finding is worrying because UNIVEN Library does indeed have someone dedicated to dealing with copyright issues. Library management has not communicated this information clearly to all library staff. Being unaware of such a person may lead to confusion and implications for copyright management and coordinating services and support across campus (Charbonneau & Priehs, 2014). Regarding copyright ownership, the participants gave various answers that pointed to authors, publishers, the library, and the university having copyright ownership. Others said it was difficult to understand without training.

It can be concluded that most library staff are still unsure about copyright ownership. Copyright ownership, it must be stressed, is the heart of copyright law; it is the foundation of the law, and library staff should be familiar with it to give relevant advice to users. Some academic libraries have embarked on digitisation projects since the coronavirus epidemic, and issues related to copyright ownership stem from these projects. One cannot digitise a work without knowing or identifying the copyright owner. Library staff should know about copyright ownership issues because a lack of staff awareness will lead to copyright infringement by library users (Magara, 2016).

3.4 Monitoring of copyright violations in the library

The library staff were asked who they believed to be the person or entity responsible for copyright monitoring. The results are presented in Table 4. Judging by the participants' answers, it is evident that library staff are unsure who the right person/body to monitor copyright violations in academic libraries. Some participants (15; 39.4%) believed that library staff are the ones who must monitor this infringement because, as one participant puts it, "they are closest to the scene". Other participants said they were not sure (seven; 18.4%); some said it is the responsibility of library users, while others said that the copyright owner

must perform this monitoring task. Some participants chose all the entities listed in the data collection instrument: author, publisher, library staff, and library user. The Social Responsibility Theory states that library staff must educate each other and their library users about copyright provisions on campus.

Arguably, it is everyone's responsibility (academic departments, authors, libraries and library staff, copyright officers, publishers, and library users) to monitor for copyright violations in academic libraries. There is copyright law in the country, and one of its purposes, amongst other things, is to deter people from copyright infringements. This law binds everyone. Having a copyright policy would help clarify and emphasise this issue.

Table 4: Monitoring of copyright violations in the library   N=38

Copyright monitoring	Count	%
Author	2	5.2
Publisher	0	0
Library staff	15	39.4
Library user	5	13.1
Unsure	7	18.4
All of the above	12	31.5
Both library staff and users	1	2.6
Total	**42**	**110.2**

Linked to the issue of monitoring, participants were also asked what they did when they saw a copyright violation occur. It should be noted that neither the UNIVEN Library nor the university itself has a copyright policy that would guide this. Given this and judging by the variety of responses from participants, it can be concluded that there is no prescribed or systematic way for staff to handle situations of infringement. Some of the comments from the participants were:

- "Make the user aware of the consequences of infringement."
- "I usually call them to attend the information literacy workshops covering copyright awareness, plagiarism and others".
- "I just ignore the person."
- "A suitable fine is imposed on that particular individual."
- "Make the user aware of the criminal activity."
- "I will give an infringer a warning."

Five participants said that they did not know what they would do. The lack of a copyright policy reveals uncertainty about how to act. The policy and guidelines will clarify what library staff must do. Copyright policies must be clear and well communicated, and procedures should be appropriate so that library users understand them (Young, 2001).

3.5 Challenges encountered with copyright enforcement in academic libraries

Library staff were asked about the challenges they encounter with copyright enforcement, and the results showed that a variety of copyright challenges being encountered. Most library staff were worried about the lack of copyright awareness among library users. Some library staff, linking in with the findings in the section above, said their challenge is that they do not know what to do when seeing copyright violations in the library. Others said their main worry was when the client infringed copyright and refused to cooperate. Some library staff were concerned that most library users intentionally ignored copyright rules. The lack of training for library staff on copyright issues was raised as another challenge, as was the difficulty in enforcing copyright on digital materials.

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Given the variety of responses received, it is evident that library staff need regular training on copyright to know what to do when encountering copyright infringements. Library staff in Uganda stated that one of the challenges regarding copyright infringements was that library users borrow and take library books outside the library for photocopying, where copyright infringement is rife (Magara, 2016). When asked about their copyright challenges concerning digital copyright laws, participants in the study by Polak (2009) stated that they did not have definite guidelines or directions and believed that there were no laws currently addressing copyright in the digital environment. Having a copyright policy (which could include a copyright checklist) would make it easier for the library to respond to the challenges and other issues that arise.

4 Conclusions and recommendations

The findings allow UNIVEN Library staff to provide better copyright-related services to users. The level of copyright knowledge/awareness is reasonably satisfactory. However, by organising regular training (workshops or seminars), the library can do more to ensure that library staff are confident and conversant with copyright issues. Based on the research findings and gaps in knowledge, the following is recommended, among others:

- The UNIVEN Library must develop its copyright policy and guidelines that list, among other issues, the types of copyright infringements and sanctions available.
- The UNIVEN Library partners with IP law experts based at the School of Law and outside of the university (such as DALRO) to arrange training (webinars/workshops) on all copyright issues relevant to library staff (and users).
- The UNIVEN Library needs effective and convenient information and digital literacy programmes designed to assist users with issues related to copyright. Users need to be adequately assessed in terms of their understanding of copyright. These programmes must be compulsory for all students and, ideally, credit-bearing to encourage good attendance.
- The UNIVEN Library has a staff member who deals with copyright issues. It is recommended that this person focus exclusively on copyright issues. This office must be well marketed to both staff (academic and library) and students so they know where to take their copyright queries and concerns.
- Finally, it is recommended that the library continue to display copyright notices in all photocopying areas and produce posters and flyers concerning copyright issues. Furthermore, the South African Copyright Act and the CAB must be available on the library, university website, and social media platforms for easy referral.

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8. The Perceptions of Law Students on the Information and Digital Literacy Programme at the University of Namibia

Chiku Mnubi-Mchombu*; Linda Ndapandula Mbangula**

University of Namibia

*cmchombu@gmail.com, cmchombu@unam.na; **nlmbangula@unam.na

Abstract

This study assessed the usefulness of the information and digital literacy programme offered to law students from February to September 2022 at the University of Namibia. Future lawyers need information literacy skills to conduct legal research. The objectives of the research were namely to assess the usefulness of the information literacy programme, establish which databases were used mainly by law students, identify the right time to provide students with library orientation to impart information literacy skills, identify the challenges faced by students in searching information using OPAC and electronic databases, and make recommendations on how to improve library orientation to law students. The study used a mixed-method approach to collect data. One hundred printed self-administered questionnaires were distributed to law students, but only 40 returned. Furthermore, a link was shared with the class representative for students who did not respond, and an additional 52 responses were received. This gave a total of 92 responses that were received. The findings showed that the session was rated as very good and information-rich. However, the respondents suggested that the programme should be conducted during the first semester after late registration has taken place and at the beginning of classes; there is a need to increase the number of users for Juta Online, and that the same programme should be conducted during the weekend for part-timers and online students to participate as well. The University library has addressed some of the challenges identified in this study, and the feedback was shared with the students in April 2023.

Keywords: *Namibia, information literacy, library orientation, academic libraries*

1 Introduction

The digital age has changed how users can access library information. It has provided a wide range of information resources, requiring the users to have knowledge and skills to access information and make informed decisions.

According to UNESCO (2005), information literacy empowers people from all walks of life to seek, evaluate, use, and create information effectively to achieve their personal, occupational, and educational goals. It is a fundamental human right in a digital world and promotes social inclusion in all nations.

Information literacy programmes prepare students to be self-dependent in searching for relevant academic materials. As Malanga (2017) notes, information skills empower students to master content, extend their investigations, become self-directed, and assume greater control over their studies. In addition, many undergraduate students come from schools that do not have libraries, computers, and Internet services, or for those with libraries, most of them are dysfunctional; thus, students lack the critical skills to search for information.

An information literacy programme is essential for law students because it prepares them to be competent legal researchers. A study on Information Literacy in Law in the USA by Kauffman (2010) noted that improving information literacy in law translates into improving the legal research competencies of lawyers. Another study on the Next-Generation Framework by Wilcoxon (2023) in the USA suggests that law librarians should equip law students by incorporating, among others, critical legal information literacy

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pedagogy into legal research instruction. Critical legal information literacy will assist students in developing a critical consciousness about legal information. It is important to note that law students depend on law materials as sources of information, such as statutes, case law, government gazettes, treaties, journal articles and law books. This means that information literacy skills are critical to future lawyers.

2 Literature review

2.1 Importance of information literacy

Information literacy has been defined differently worldwide. The most accepted definitions are by the American Library Association and UNESCO.

The American Library Association (2000) defines information literacy as the ability to recognise when the information is needed, locate and evaluate information, and effectively use the needed information. UNESCO (2008) defines Information Literacy (IL) as the capacity of a person to recognise the information needs, locate and evaluate the quality of information, store and retrieve information, make effective and ethical use of the information, and apply information to create and communicate knowledge. Both definitions underscore the importance of literacy skills as enshrined in the need to find, retrieve, analyse and use information ethically.

The advancement of technology has increased the amount of information produced in different formats. Thus, libraries must empower users with skills to determine their needs, identify and evaluate the sources, preserve the information for their future needs, and use it ethically. Moyane et al. (2015) suggest that the purpose of the university library is to provide information sources relevant to learning, teaching, and research, as well as to empower users with the skills that will assist them in becoming independent and lifelong users. Jiyane and Onyancha (2010) and the Scottish Information Literacy Project (2013) underscore that information literacy is universally accepted as an effective means to develop the information skills of users, especially in Higher Education Institutions. Furthermore, the Scottish Project on Literacy Skills (2013) and Durodolu and Mojapelo (2020) describe information literacy as the solution for problem-solving abilities, particularly to the problems emanating from modern technology that facilitates information access.

Information literacy is very important for law students who are future legal practitioners. Students must be able to recognise their information needs and locate, store and retrieve the information and make ethical use of it. For example, in the United States, the Bar Association has recommended teaching information literacy, equating to law school legal research. As Kauffman (2010) opines, improving information literacy in law students equates to developing methods for improving legal research skills among lawyers. These skills are essential because they prepare students to use various sources of materials, from print to electronic resourcesBalog and Siber (2016) explain that in the United States, legal research is foundational to legal practice because it is an essential skill that supports fundamental lawyering skills. These skills include problem-solving, legal analysis and reasoning, factual investigation, communication, counselling, negotiation, litigation and alternative dispute resolution procedures, organisation and management of legal work, and recognising and resolving ethical dilemmas.

A study conducted by Syvalahti and Katjihingua (2012) on the information-seeking behaviour of law students at the University of Namibia found that the most popular information resources by law students were books by 50 (65%), statutes and law reports by 48 (62%), short loan collection by 48 (62%) and electronic materials by 31 (40%). The main problems and barriers identified by respondents were slow Internet services, few computers in the library, and few law books in the University of Namibia library.

Scholars have suggested that the law is highly dependent on case law, which the students must read, analyse, and dissect. Thus, training the students to find case law and statutes is essential. These skills are

necessary for keeping updated with information. Laws are updated/amended, and court decisions need to be followed because, in some instances, the higher court may overturn the lower court's decision.

2.2 Sources used by law students

The advent of electronic law databases like Hein Online, Juta Online, LexisNexis, and Westlaw aims to provide access to legal materials. Unfortunately, such databases will remain underutilised if lawyers do not have the skills to access the information. Jiyane and Onyancha (2010) also noted that the underutilisation of resources is partly attributed to a lack of information literacy skills.

The so-called "born digital generation" of law students knows how to use computers to locate information from popular search engines. However, they do not know how information can be analysed, evaluated and used ethically. As Krishnaswami (2014) opines, the "born digital generation" of law students cannot analyse or evaluate the retrieved information. A study in Ireland on engineering and law students' information-seeking behaviour revealed that undergraduate students depend on the Internet to search for information and spend much time doing this (Kerins et al., 2004). Thus, information literacy is essential because it enhances legal research skills, as Kauffman (2010) suggested. Students who participated in the information literacy program improved their legal research competencies, preparing them to exploit different sources in different formats.

2.3 Timing for information literacy

The timing must be appropriately considered for information literacy to be effective and well-attended. A study by Moyane et al. (2015) on evaluating user education in KwaZulu Natal, South Africa, found that organising orientation programmes at the beginning of the year clashes with the registration process. This means that students have not settled down or established their information needs. As a result, not all students attend the information literacy programmes. Kauffman (2010) alludes that legal research in the USA is taught too early in the law school curriculum before students have adequate knowledge of the law to determine their legal information needs. In addition, legal research is too complex to be taught in one course.

2.4 Challenges faced by students in searching for information

A study by Jiyane and Onyancha (2010) on information literacy and instructions in academic libraries in South Africa found that students who join universities lack basic computer literacy skills because most come from poorly technologically equipped schools. Similarly, a Malanga (2017) study in Malawi found that most students come from environments without school libraries, computers, and Internet services. This can partly be attributed to the low usage of resources, especially electronic databases.

The information literacy programme is not mandatory. Thus, few students attend the programme; some do not think they lack information literacy skills (Jiyane & Onyancha, 2010).

3 Study's aim

Academic institutions are spending much money to acquire different resources for the university community to support teaching, learning, research, and innovation. A library orientation programme is essential for the resources to be effectively utilised. The librarian is responsible for equipping students and researchers with the necessary skills to help them optimise using different resources.

From February 2022 to September 2022, the Law Subject Librarian from the University of Namibia Library introduced students to different resources and how to retrieve information from the Open Access Catalogue (OPAC) and electronic databases. Students were introduced to how to search for books and

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journal articles using the OPAC, how to search for case law and statutes using the Juta online database, and how to search for ebooks using discovery and individual databases such as Ebsco ebooks, Proquest, Taylor and Francis, and Cambridge.

The study aimed to determine the usefulness of the information literacy programme for law undergraduate students to use the resources independently after receiving the training at the University of Namibia, Main Campus in Windhoek. The programme took place both face-to-face and online.

The specific objectives of the study were to assess the usefulness of the information literacy programme, establish which databases were used mainly by law students, identify the right time to provide students with library orientation to impart information literacy skills, identify the challenges faced by students in searching the information using OPAC and electronic databases, and make recommendations on how to improve library orientation to law students.

4 Research methodology

The study used quantitative and qualitative approaches to collect data. A survey method was applied using an online questionnaire distributed to all law undergraduate students, and a few printed questionnaires were distributed randomly to increase the response rate. The questionnaire included closed and open-ended questions to determine the impact of the library orientation programme, which took place in 2022 for all law students at the University of Namibia, Main campus in Windhoek. The population for the study was undergraduates registered in the law school in the 2022 academic year, with 1435 students. Due to time limitations, students who were doing diploma and postgraduate studies at the law school were excluded.

One hundred printed self-administered questionnaires were distributed to students, but only 40 were returned, accounting for a 40% response rate. Furthermore, a link was shared with the class representative for students who had not responded to the printed questionnaire from the first to the fourth year, and we received an additional 52 responses. In total, 92 responses were received. The data collected from open-ended questions were qualitatively analysed using thematic content analysis, while the data from closed-ended questions were quantitatively analysed.

Participation in this research was voluntary. A written statement was provided in the questionnaire for the participants to read before answering the questions. Measures were taken to avoid harming the participants in any way, either physically or emotionally. The protection of the identity of participants from the public was ensured through anonymity during the questionnaire completion by them not indicating their names.

5 Data Analysis

The sample size consisted of 92 respondents. The majority of respondents, 56 (60%), were between 21 and 25 years old, followed by those between 16 and 20 who were 22 (24%), those between 26 and 30 were 8 (9%), and those 36 years and above were 6 (7%).

Female students were the majority, with 60 respondents (65%), followed by males at 28 (30%). Four respondents did not indicate their gender. Generally, female students comprise the majority of undergraduate programmes at the University of Namibia.

Most participants were in their second year, with 35 responses (38%), followed by fourth years, with 18 responses (20%). First-year students were 16 (17%), third-year students were 14 (15%), and 3 (3%) responses were from second-year students doing the Diploma in Dispute Resolution. There were 6 (7%) respondents who did not indicate their programme of study.

5.1 Training session - Online Public Access Catalogue (OPAC)

The respondents were asked to indicate how helpful the session was in the search for materials using OPAC. The majority of respondents, as represented by 75 (82%) of them, answered positively, while 12 (13%) responded negatively, and 5 (5%) did not respond, as indicated in Table 1.

Table 1: The following are some of the responses about the OPAC session

"It was shown clearly how to get the necessary materials and what certain descriptions mean when locating resources."; "It helped me know where and how to research for my studying and assignments."
"Very useful"; "It was beneficial and helped me in conducting better research"; "E-resources on textbooks quite helpful was not aware in the functions that the platforms provided before the lessons"; "It was very insightful, I managed to gain access to a lot of useful textbooks."; "The lesson was beneficial, informative and effective. I have learnt a lot about using the catalogue and finding information."
"It came in very handy, especially for modules like research and public international law when completing assessments and studying for these modules."
"The lesson was very informative, and the catalogue makes it very easy to access information off-campus"; "It was very informative"; "Informative and resourceful."
"It is very informative and helps us better understand how to use some resources we are never even aware are available to us as students constantly researching."
In the future, such lessons should be available to watch during the December holiday for the next academic year."
"It surprised me that most of my peers were unaware of such a blessing."
Poor Satisfaction Level
"Mostly, the network is not good, and we use hotspots to access information."
"We were organised in groups on a random day, and there was no time to grasp or ask questions about the lesson. There is a need for a step-by-step instruction manual somewhere on Moodle."

5.2 Training session on e-resources

Participants were asked about the usefulness of the training session on using electronic resources. The majority, 66 (72%) respondents, confirmed that the session was helpful, but 10 (11%) respondents stated it was not valuable.

The following were the views of the respondents about the usefulness of training on the use of different electronic resources:

- "Informative and needs to be conducted every year"; "Very informative and a good helping guide to us as students"; "It was beneficial."
- "Like I said, she was amazing"; "It was useful."
- "It allowed us to explore more databases when assessing and studying for our modules. We could navigate between the different databases and get sufficient information."
- "There was a real effort - maybe it was effective. It could also have been so due to COVID."; "I understood the lesson very clearly."
- "More sessions should be conducted to help students be independent in searching for journal articles. Overall, the sessions were informative."
- "Also, very useful as this was not readily available before the lesson."
- "I saw that one could find much useful information."

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- "It was also beneficial. For someone who used many articles and did not know how to find them, I have learned a lot."
- "The information is plentiful and easy to find if you know what you are looking for and use the correct keywords"; "I learnt a lot. I did not have to buy certain textbooks because I could access those resources."

For those who felt that the session was not helpful, they had this to say:

- "It was unclear, but I managed to understand it later".
- "Could be better explained, and system error frequently occurred on my side."

Another question was to find which electronic databases are mostly used by students:

Table 2: Useful databases

Library Databases	Number of Responses n=134	Percentage
Juta Online	39	29 %
JSTOR	24	18%
Southern African Legal Information (SAFLII)	17	13%
Hein Online	14	10%
SABINET	12	9%
Ebsco Ebooks	11	8%
Cambridge International Law	5	4%
Oxford University Press	5	4%
Hague Academy of International Law	4	3%
Taylor & Francis	3	2%
Total	134	100%

Table 1 shows that Juta Online was the most 39 (29%) used database, followed by Jstor with a 24 (18%) response rate, while Southern African Legal Information had 17(13%) and Hein Online with 14(10%). Taylor & Francis had a low response rate of 3(2%), followed by the Hague Academy of International Law with a 4(3%) response rate. The findings almost correlate to those by Toteng et al. (2011), where most law students at the University of Botswana preferred to use Juta, followed by Ebsco Host, LexisNexis, SA-Publications and Jstor.

5.3 Appropriate time

A question was posed to determine the appropriate time to introduce students to library resources. The majority, 51 (55%) respondents, preferred the first semester, while 29 (32%) preferred both semesters. In addition, 3 (3%) respondents specified that it should be as early as possible at the beginning of the semester.

5.4 Challenges in Accessing Information

Another question was about the challenges that users experience when searching for information. The following were the views of the respondents:

i.   Off-Campus Access

"Sometimes Juta is not available while off campus on the weekends."

"When accessing the Namibian cases category, I am redirected to a blank page."

"Hard to access databases while off campus."

ii.   e-Books

"Some prescribed books are not available on E-books and it makes it very hard for us law students to find the necessary information for our tests, assignments and tests, and some or most of us can't afford hard copy books because they are very expensive at the bookshop, that is why we rely on soft copy books. It will be very beneficial for all students if the university can acquire all the prescribed books in soft copy and upload it on the rare E-books site so that it can be accessible by all the students."

iii.   Locating the Materials

"I can't find some of the documents I am looking for"; "Most books are not available, especially prescribed books"; "At times, it doesn't state if the book is available or not and it also fails to bring up the exact book searched for, even after using the right keywords."

• "Getting the location of the books"; "Do not know where to find everything"; "Some material is not available on the resources that UNAM provides, for example, Administrative Law by Hoexter. I had to use another fellow university student's details to be able to access the online version."

• "At times it doesn't state if the book is available or not and it also fails to bring up the exact book searched for even after using the right keywords."

iv.   Internet/Network problems

"Internet not reliable, and takes time to load."

"Network problem especially over the weekend."

"E-books cannot be fully downloaded for online use."

"There are times when I cannot access information due to a system overload."

"The web is outdated, navigation is not easy, glitches when downloading documents."

v.   Journal Articles

"Not all articles are available in full text in the databases."

"Some journals and articles I don't have full access."

6 Recommendations

Respondents were asked to suggest how the information literacy programme could be improved in future. Several suggestions were made, and these include the following:

6.1 Databases
• It was recommended to subscribe to databases such as Studco Course Hero and more databases with more ebooks in the legal field;
• "The current databases are good; no need to improve."
• "A brief description of the resources would be nice. It is impossible to remember which ones apply to law students."

6.2 Books on Namibia jurisdiction/ prescribed textbooks
• "More books must be acquired, especially those with Namibian jurisdiction or relevance."
• "All prescribed textbooks should be available via the website."
• "It would be beneficial if the university could provide all the prescribed books in pdf format."

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6.3 Payment for articles

- "Help with payments required in JSTOR."

6.4 Early training on information literacy

- "Provide training early so that students are aware of the IL programme."
- "Provide IL training sessions earlier in the first year."
- "IL programme should be initially for first-year students."
- "They give us training the second year only, not the first year."

6.5 Video tutors and manual

- "Tutorials readily available online."
- "Maybe provide a digital handbook/manual"

6.6 Access to WiFi

- "Campus WiFi to be accessible all time and ensure that law sources are useful to students."
- "Wireless access to be available everywhere on campus"
- "Make it accessible on weekends and off-campus."

6.7 Internet connectivity

- "Make it accessible on weekends and off-campus."
- "Off-campus access needs to be improved."
- "Improve the network capacity."

6.8 Juta online

- "Increase the number of users who can access Juta online simultaneously as the current limited number is reached too quickly."
- "Allow more students to access Juta at the same time as some people or users are kicked out / do not allow us access after an influx of students has occupied it."
- "Update cases in Juta as not all cases are available."

6.9 Updates on databases

- "Give frequent updates on which databases are available and accessible."

The interpretation of some of these responses shows that respondents had broader information needs that went beyond information literacy; hence, to give total satisfaction, both their information needs and information literacy had to be addressed in the future.

7 Conclusion

The research findings showed that most law students' information literacy sessions helped them search using OPAC, electronic articles and databases. A reasonable number of students suggested that the session should be in both the first and second semesters. The study also found that Juta Online, Jstor, SAFLII, Heine Online and SA Publications are the most used databases. In contrast, other databases like the Cambridge International Law, Oxford University Press, Hague Academy of International Law and Taylor & Francis have low usage among undergraduate students. Based on the findings, the study recommends the following:

- The information literacy class should be conducted in both semesters;
- The students should be trained on how to use the less-used databases;
- The library should provide information literacy classes online during the weekend to target part-

time students;

- All prescribed textbooks should be subscribed to as ebooks with different features like EPUB to take care of students with low vision;

- Increase the number of licenses for Juta online; and

- Provide a list of available databases to all students

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9. Information Ethics Adoption in Managing Open Access Electronic Resources by Zimbabwean University Libraries

Howard Hogo*; Ruth Hoskins**

University of KwaZulu-Natal

*howard.hogo@gmail.com; **HoskinsR@ukzn.ac.za

Abstract

The explosion of so much technology and subsequently open access electronic information resources (OAEIR) has brought information ethics to the forefront of ethical considerations. Against this background, fair and rational use of information for solving day-to-day problems is increasingly becoming challenging in this information society. As increased focus and attention in the information society is now towards the intellectual debate on information ethics and ethical dimensions, there is increased attention to professional ethics due to the massive growth of contemporary technologies that have altered the way Library and Information Science (LIS) professionals acquire, organise, and disseminate information to their clientele. Not much empirical research on information ethics was available, and the study was conducted to determine LIS professionals' adoption of information ethics standards in managing OAEIR and the ethical dilemmas encountered. The study adopted the deontological ethics theoretical framework and the PAPA information ethics framework. The study used a pragmatism worldview as a research paradigm, a mixed-methods research approach, and a sequential explanatory research design. The study population was drawn from LIS professionals serving in nine Zimbabwean university libraries. The findings revealed a lack of awareness and, subsequently, adoption of information ethics, thereby creating many ethical dilemmas for LIS professionals. Additionally, LIS professionals' culture influenced their application of ethics, ushering in a cultural dimension to ethics.

Keywords: *Electronic resources, ethics, ethical dimension, information ethics*

1 Introduction

The information society has provided the library system with multiple academic information sources. Frederiksen et al. (2011) noted that academic libraries worldwide had hugely increased their electronic collections in response to the information society – a society getting informed through computer technologies based on the massive exchange of information and extensive user demand for digital information. University libraries now house many open access electronic information resources (OAEIR), ranging from openly accessible electronic book chapters and journal article databases to locally hosted digital collections of staff and students' scholarly literature, all within the context of the open access movement. However, these fascinating new library publishing purposes have posed many questions about information ethics standards to LIS professionals in academic libraries. Hoq (2012) noted that the emergence of an information society had added a new dimension to the age-old debate on 'right' and 'wrong'. LIS professionals were also burdened with this fundamental question of determining whether their actions were right or wrong, ethical or unethical. Igbeka and Okoroma (2013) noted increasing attention to professional ethics due to the massive growth of contemporary technologies that altered how LIS professionals acquired, organised, and disseminated information to their clientele. According to Alexander and Moore (2016), information ethics investigates ethical issues arising from developing and applying information and communication technologies (ICTs) in libraries. Reitz (2017, information ethics) added that ethics when applied to the LIS field, become information ethics, a "branch of ethics that focuses on the relationship between the creation, organisation, dissemination, and use of information, and the ethical standards and moral codes governing human conduct in society." It provides a critical ethical framework for considering moral issues concerning information privacy, accuracy, intellectual property, and access arising from the lifecycle of information in the digital environment.

Whilst university libraries in Zimbabwe have been steadfastly embracing OAEIR, adopting ethical standards and moral codes governing LIS professionals' conduct and involvement in the creation, organisation, and dissemination of these OAEIR still needs to be broadly examined. Due to the proliferation of these OAEIRs, there is now an increased need to examine the adoption of privacy, accuracy, property, and access ethical standards as LIS professionals daily deal with the ethical challenges of their management. The study sought to assist LIS professionals in aligning OAEIR provision to library clients with appropriate information ethics standards. The study sought to achieve this by determining the level of adoption of information ethics standards. LIS professionals' adoption of information ethics standards, ethical dimensions, and associated dilemmas are increasingly becoming topical issues in the information society.

The adoption of information ethics standards by LIS professionals in the management of OAEIR still needs to be broadly examined. Although ethical considerations have been a cause for concern for LIS professionals over the years, little empirical research has been available on LIS professionals' ethics. Capurro's (2013) assertion that the discipline of information ethics was still an open task in Africa and not much study had been carried out on the subject is still broadly applicable today. This has led to stifled growth and possible implementation of information ethics standards in university libraries. Britz (2013) asserted that an empirical reflection by Africans on information ethics in Africa was in many ways still in its infancy, "and not much research had been done on the African continent on this critical topic" (p. 4). As a result, LIS professionals' adoption of information ethics standards in the management of OAEIR is still essentially an open area.

Additionally, although information ethics has grown over the years as a discipline, in LIS, courses devoted regularly and solely to information ethics issues are still very scarce. In Zimbabwe, LIS schools do not have specific courses devoted specifically or wholly to information ethics, just like business ethics for business students and medical ethics for medical students, and it tends to be taught in the context of broader course modules (Hikwa, 2010). Britz (2013) added that information ethics was generally not part of the curriculum in African higher education institutions. Where it is taught, it is mainly done within the Western philosophical traditions, thereby becoming clear that there is an urgent need to integrate African ethical values into the international debate in this global information society. To this end, Adebayo et al. (2016) stated that LIS professionals need to be aware of the core values and ethics of information management that arise from the lifecycle of electronic information resources. Though LIS professionals 'ethics in practice' have created much interest from various scholars, not many studies have been executed to determine LIS professionals' level of awareness, perception, and adoption of information ethics (Adebayo & Mabawonku, 2017; Phillips et al., 2018). Thus, Adebayo and Mabawonku (2017) stated that LIS professionals' awareness, perception and level of ethical practices in their day-to-day duties had to be explored. In addition, Phillips et al. (2018) stated that for LIS professionals, it was essential to study their level of awareness and adoption of information ethics standards in their information service delivery.

2 Methodology

The study primarily used the Deontological Ethics theoretical framework, sometimes described as the duty-based approach. Deontological ethics is a normative ethical theory concerned with what people do, not the consequences of their actions. It judges the morality of an action based on rules, thereby making the action more important than the consequences. In this study's context, deontological theories deal with the obligations and permissions LIS professionals have in managing OAEIR, which are binding or proper in relation to societal values and norms. Using the Deontological Ethics theory, the study examined LIS professionals' adoption of information ethics standards based on set rules (contractarian) instead of the consequences of their actions (consequentialism).

The study used the pragmatism research paradigm, a philosophical underpinning for mixed methods studies (Creswell, 2014; Gray, 2018; Kaushik & Walsh, 2019). The study used a combined research approach, where

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elements of both quantitative and qualitative approaches are combined in various ways within different stages of a research study. However, they remain relatively independent until the interpretation stage. Reams and Twale (2008), as cited in Cohen et al. (2011, p. 22), argued that a mixed research approach is ideal for a study that needs to expose viewpoints in a less biased and more accurate conclusion after validating the data. Additionally, the study used a sequential explanatory research design. Driscoll et al. (2007, p. 21) stated that "sequential mixed methods data collection strategies involve collecting data in an iterative process whereby the data contained in one phase contributes to the data collected in the next." The study population was drawn from 122 LIS professionals serving in nine Zimbabwean university libraries, representing 50% of the chartered universities in Zimbabwe. The study used the census survey sampling technique and purposive sampling for operational-level LIS professionals and managerial-level LIS professionals, respectively. The researcher used methodological triangulation to gather data using structured questionnaires (for operational-level LIS professionals) and semi-structured interviews (for managerial-level LIS professionals). Additionally, the study used document analysis, which looked at OAEIR-related policies and standard operating procedures. Lastly, the study used descriptive statistics and thematic content analysis and the Statistical Package for Social Science (for quantitative data analysis) to analyse data.

3 Findings

The study sought to determine the adoption of information ethics in OAEIR management by LIS professionals, both from the awareness and application sides. The study revealed that slightly more than half of the LIS professionals in university libraries were aware of the LIS code of ethics, while just another half were in the dark regarding the LIS code of ethics. However, even among those aware of the LIS code of ethics, many respondents did not know any specific ones, raising questions about whether they were genuinely knowledgeable. There was generally a lack of information on ethics available to LIS professionals, thereby affecting the provision of information versus implementing laid-down ethical policies in libraries. Again, the responses highlighted that mostly junior LIS professionals did not have the codes available for use, as they were not easily accessible and hence not used for day-to-day decision-making. The findings noted that the codes of ethics slightly influenced practice in university libraries' management of OAEIR. In such rare cases, they were more concerned with observing clients' privacy issues in creating, organising, and disseminating OAEIR information. LIS professionals were aware of and applied the PAPA ethical framework and made related ethical considerations in managing OAEIR. The accuracy of information was of paramount importance, followed by property and access. However, the study listed clients' privacy as the least important consideration of information ethics.

In applying ethics in electronic information, libraries had the same ethical obligation regarding the information presented in print and electronic format as the information was the same despite its varying delivery modes. However, there was a need for more ethical obligation efforts in the electronic information format emanating from electronic content trust issues by users of the information. Ethics requirements within libraries were very high, with most LIS professionals required to observe ethical considerations in their everyday duties, thus suggesting that ethical concerns were receiving attention in libraries. However, a lack of clear policy direction regarding LIS professionals' ethical obligations in electronic content affected how ethical issues were implemented in everyday electronic library workflow operations. Slightly more than half of the library policies had an ethical conscience, though they were not specific on the overall PAPA issues. Though most of the policies and standard operating procedures (SOPs) already covered the creation, organisation, and dissemination workflow of OAEIR, they did not spell out the LIS professionals' ethical obligations.

Additionally, awareness of ethical principles presented in these policies was, to a greater extent, restricted to senior LIS professionals at the expense of their junior colleagues. Almost half of the LIS professionals encountered situations that required ethical judgment in their handling of OAEIR, whilst a slight majority did

not encounter any ethical situations in their handling of OAEIR. This suggested that most LIS professionals were either unaware of the required ethical practice or were not implementing it in the management of OAEIR. Again, the earlier related findings revealed that even among those aware of the LIS code of ethics, a very high number of the respondents did not possess knowledge of any specific ones, raising questions about whether they were genuinely aware.

Most libraries held LIS professionals accountable for not applying ethical considerations in the management of OAEIR. Library supervisors, such as Client Services Librarians, Content Management Librarians, Information Services Librarians, and Systems Librarians, monitor their staff's ethical implementation as part of quality control duties or through the strategic plan documents policies and standard operating procedures. However, the documents mentioned above were not yet specific on information ethics or PAPA in general, so the policies and procedure manuals were silent on that aspect. The implications of fully adopting information ethics standards in managing OAEIR in libraries would require additional professional librarians to be recruited in university libraries (as opposed to para-professional staff). This change would be in areas such as monitoring and evaluation, quality assurance and ethical compliance, and catering for other changes in the workflow procedures. Additionally, though there was a need for re-training, the current staff's skill level change was not going to be wholesome, as they were recruited in the digital era and, thus, could handle most contemporary ethical concerns in libraries. This mindset change and retooling would have a bearing on library job titles, where creating new ones and duties would be befitting to address the emerging ethical standards issues in this information age.

In this electronic information revolution, most LIS professionals faced new ethical dilemmas in all of the management processes of OAEIR, which included creation, organisation, and dissemination. The dissemination of OAEIR posed more significant ethical problems for LIS professionals. Technological factors and the electronic information revolution have created many problematic ethical grey areas for LIS professionals due to a lack of control over the information and its access. In terms of electronic information provision in libraries, inaccurate information was made available to clients due to predatory content, creating an ethical problem for LIS professionals. Regarding intellectual property, major ethical grey areas surrounding electronic information were ownership of information, plagiarism, and copyright infringement. LIS professionals' incapacity to manage or detect plagiarism for IR content, in breach of intellectual property rights, was also an ethical grey area. However, the problem slowly subsided, with most African higher education institutions embracing antiplagiarism platforms. Privacy issues surrounding electronic information were one of the significant new ethical problems presented to LIS professionals, as it was difficult to police and control clients' privacy in the cyber environment. LIS professionals were having difficulties with all of the PAPA ethical frameworks in the management of OAEIR. Collectively, the dissemination of information caused major PAPA ethical dilemmas for LIS professionals in their handling of OAEIR.

Regarding clients' confidentiality, dissemination of OAEIR presented significant ethical dilemmas for LIS professionals. To mitigate the challenge, personal or individual authentication details were used in libraries to protect clients' privacy. However, using passwords was designed more to protect library resources than the clients themselves. LIS professionals use organisational values and duty-based principles as the basis for their ethical decision-making. In some instances, they were aided by experiences (personal beliefs) where no ethical policy framework existed.

4 Discussion

The conclusion drawn from the findings is that information ethics is generally new to LIS professionals, as many of them are unaware of it, let alone practise it in their professional duties, calling for the need for publicity. Igbeka and Okoroma (2013) indicated that though ethical codes had been in place in the LIS

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field, many LIS professionals were not aware of them, let alone practised them in their professional duties, calling for the need for publicity. The findings confirm Onoyeyan et al.'s (2014) view that most practising LIS professionals did not have a copy of their professional code of ethics document. Thus, they were unaware of its contents, compromising their ethics adoption rate. The findings also supported Mwafulilwa's (2017) view that not all LIS professionals in university libraries were aware of ethical issues arising from using modern technologies and subsequent management of OAEIR. This presented "a catch-22 situation" in university libraries regarding implementing ethical considerations in various library information provision processes. This shows that, generally, LIS professionals execute their professional duties without following ethical guidelines (Igbeka & Okoroma, 2013). The study reaffirmed Onoyeyan et al.'s (2014) finding that little was being done to assist LIS professionals in understanding professional ethics. Most LIS professionals were not fully aware of the ethical consequences of their day-to-day actions to make the best ethical decisions when confronted with ethical dilemmas (Phillips et al., 2018). Thus, there was a need to educate LIS professionals on the profession's ethics in this information society. Phillips et al. (2018) noted that although LIS professionals' awareness of the ethical issues in LIS service delivery had improved over the years, adopting the PAPA ethical framework in this contemporary library environment had not been fully established.

University libraries' affiliation with the LIS code of ethics was viewed in terms of these institutions being members of either AfLIA or IFLA. Still, there were no clear guidelines on how they would draw from these codes, as specified by the codes themselves. To exacerbate the matter, local professional associations were not doing enough to conscientise LIS professionals on the profession's ethics through advocacy, awareness, and staff development. As a result, university libraries lacked clear policy direction regarding LIS professionals' ethical obligations in electronic content, affecting how ethical issues were implemented in everyday electronic library workflow operations. Where some library policies had a semblance of ethical consciousness, they were not specific on PAPA issues in an elaborate format. Chandel and Saikia (2012), Igbeka and Okoroma (2013), Onoyeyan et al. (2014) and Echterling (2019) noted that not much was being done to assist LIS professionals in understanding professional ethics as well as the ethical consequences of their actions. This resulted in many LIS professionals executing their professional duties as though there were no ethical guidelines. Again, awareness of ethical principles was more evident in senior LIS professionals at the expense of their junior colleagues. This scenario affected how ethical issues were implemented in everyday electronic library workflow operations. The above findings were consistent with Chandel and Saikia (2012), Igbeka and Okoroma (2013), and Khan (2016), who stated that the existence and awareness of ethical codes alone without measures to enforce these ethics was as good as having none. Igbeka and Okoroma (2013) and Adebayo and Mabawonku (2017) reinforced this view by highlighting that LIS professionals' awareness of ethical codes alone without measures to enforce these ethics at the organisational level was insufficient and was as good as having none. Thus, LIS professionals were encouraged to develop separate collection development policies for print and electronic information resources.

Contemporary library trends in information generation, management, and information-seeking behaviour of library clients have created many ethical dilemmas for LIS professionals. Additionally, the electronic information revolution has created many ethical grey areas for LIS professionals due to a lack of control over the information and its access. Integrating these ICTs into LIS professionals' day-to-day practices has simultaneously transformed regular ethical issues and generated new ethical problems (AL-Nuaimi et al., 2017). LIS professionals' current duties were becoming more complex than ever due to the emergence of technology and the life cycle of OAEIR information, and they had to deal with many contemporary information ethics decisions and ethical dilemmas. Matingwina (2015), Adebayo et al. (2016), Mwafulilwa (2017), and Munigal (2018) noted that LIS professionals faced severe ethical dilemmas in the electronic information resources management cycle due to the increasing complexity of communicating and sharing information in this modern society.

Additionally, LIS professionals encounter ethical dilemmas in the information society generated by both the information side and the users of this information, namely, the library clients (Mutula, 2013; Mwafulilwa, 2017). As LIS professionals are now facing many ethical dilemmas, a call for more awareness and practice of ethics in libraries has been made, including re-branding duties and responsibilities to reflect their contemporary roles as content custodians in this super information-intensive information society (Igbeka & Okoroma, 2013; Onoyeyan et al., 2014; Adebayo & Mabawonku, 2017; Mwafulilwa, 2017; Phillips et al., 2018). Additionally, LIS professionals needed to update or develop separate collection development policies for electronic and print collections to address the unique ethical issues related to the collection development of its different formats of resources (Chandel & Saikia, 2012; Khan, 2016). Cardwell-Stone (2012) and Echterling (2019) also reinforced the above findings by highlighting that the 'print revolution' ideologies still drove library collection development policies. However, the new mode of scholarly communication required LIS professionals to revisit all practices and workflows to incorporate integral variances with conventionally published content and the use of new technologies and online content in libraries.

LIS professionals' application of ethical standards in the day-to-day management of OAEIR was influenced by duty-based principles at the library level, aided by experiences where no ethical policy framework existed. However, with a gap in clear policy direction and those 'duty-based principles at the library level regarding LIS professionals' ethical obligations in electronic content, the application of ethics appeared to emanate more from using experience and, thus, would vary according to individual taste. Again, LIS professionals' culture greatly impacted the adoption and application of ethical principles and decisions in the management of OAEIR, ushering in an African cultural dimension in the ethical management of OAEIR in university libraries. Deontology subscribed to the idea that normative ethics came from the ideology of norms and standards of a society's culturally accepted behaviour, which might differ between various societies. Ethics and practice are the critical reflections of morals, which are the customs and traditions of individuals and societies, Rhee et al. (2010), Capurro (2013), Gensler (2013) & Britz (2013). LIS professionals working in different countries would differ in morality, impacting their actions in ethics adoption and dilemmas. To this end, Sueur et al. (2013) and Phillips et al. (2018) stated that LIS professionals' behaviour was often significantly shaped by their customs and habits as they encountered ethical situations and their consequent adoption rate of ethical standards.

5 Conclusion

Generally, the subject of information ethics is still new to LIS professionals, as many of them are not aware of it, let alone practise it in their professional duties, calling for the need for publicity. University libraries' affiliation with the LIS code of ethics was viewed in terms of these institutions being members of either AfLIA or IFLA. However, there were no clear guidelines on how they would draw from these codes, as specified by the codes themselves. To exacerbate the matter, local professional associations were not doing enough to conscientise LIS professionals on the profession's ethics through advocacy, awareness, and staff development. As a result, university libraries lacked clear policy direction regarding LIS professionals' ethical obligations in electronic content, affecting how ethical issues were implemented in everyday electronic library workflow operations. LIS professionals faced PAPA ethical grey areas in all of the management processes of OAEIR, that is, creation, organisation and dissemination. Dissemination of OAEIR posed more significant ethical problems for LIS professionals due to the library clients' information-seeking behaviour, attitude and compliance, which fluctuated over the years. LIS professionals' application of ethical standards in the day-to-day management of OAEIR appeared to emanate more from the use of experience and, thus, would vary according to individual taste.

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6 Recommendations

- There is a need to conscientise LIS professionals on the profession's ethics through advocacy, awareness, and staff development.
- LIS professionals need to consider ethical issues arising from electronic content. This retooling might affect library job titles, descriptions, and workflow procedures.
- University libraries must align their policies and SOPs with ethical issues arising from using ICTs in information access and retrieval libraries and the OA movement.
- A localised code of ethics framework for LIS professionals needs to be developed. It must be customised and contextualised to the local environment, borrowing from other codes at the regional and international levels.
- LIS schools need to unpack, fully integrate, and provide more depth in offering information ethics to LIS professionals, just like business ethics for business students and medical ethics for medical students.
- Lastly, libraries' information ethics and ethical systems should be subjected to elaborate research and interpretation, calling for such at local and regional levels.

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10. Exploring eResearch Knowledge and Practices of Information Specialists at a South African Private Higher Education Institution

Edmont Pasipamire*; Brenda van Wyk**

University of Pretoria, South Africa

*edmontp936@gmail.com; **brenda.vanwyk@up.ac.za

Abstract

Literature is replete with examples of librarians, information specialists, and less seasoned researchers lacking basic research skills. Information specialists with good eResearch skills can assist all library users in conducting research utilising various digital and online sources and services. Research skills are identifying and applying statistical, technical, and theoretical information. eResearch demands academic and digital skills and fluency in digital research information and communication technology. The question to be answered is whether information specialists in this study have the necessary eResearch expertise to assist students, employees, and researchers with eResearch. In this study, a focus group was used to collect qualitative data. The findings are that the information specialists lack the knowledge of eResearch and have a traditional perspective on information services to support research. Furthermore, there is a pronounced lack of eResearch skills and eResearch practices that have not been institutionalised in the private higher education selected for this study. The recommendations include directing the development of research and research skills and competencies to support developing a research culture, identifying and proposing areas for research capacity development, and supporting undergraduate and postgraduate students to succeed in postgraduate studies and research. This paper holds scholarly value by addressing the gap in the literature concerning the deficiency of eResearch skills among information specialists, emphasising their crucial role in supporting research through digital resources; it contributes to the policy realm by recommending the development of eResearch skills to foster a research culture within academic institutions, and in practice, it underscores the need for targeted capacity development initiatives to enhance research support services and facilitate student success in postgraduate studies and research.

Keywords: *eResearch competency, research culture, research support services, digital literacy*

1 Introduction

The Private Higher Education Institution (PHEI) selected for this study has federated distributed operations and is accredited by the Department of Higher Education (DHET) in South Africa. Currently, information specialists offer research support services to students working on NQF 8 research projects and academics advancing their education. To support the expansion and improvement of research and research scholarship production, a strategy for expanding research capacity and a multi-year project plan were adopted in 2020. As academic partners, information specialists must expand Library and Information Services (LIS) to support a growing population of researchers, students, and postgraduate supervisors. Therefore, it is necessary to investigate current eResearch practices and assess readiness to provide research support services, focusing on eResearch competencies.

2 An overview of the literature

The lack of relevant research and research skills has been highlighted in several studies. As such, this raises questions about the value that information specialists in PHEI academic libraries can add regarding knowledge, skills, capabilities, and practices. Raju (2014) reported on the knowledge and skills needed for

academic specialists in South Africa and emphasised digital competencies in offering successful support. In a follow-up study, Raju (2015) noted that these skills are increasingly necessary for producing and disseminating electronic records and files, metadata administration, repository operations, digital archiving, and research data management. Furthermore, Raju (2017) compiled the LIS Competency Index for Higher Education in South Africa, where several references are made linking to eResearch skills, including metadata development and administration, library ICTs and systems operations, and research support including Research Data Management (RDM), bibliometrics, and altmetrics.

Corrall et al. (2013) noted that the delivery of eResearch services requires information specialists to understand academic and research contexts, higher education environments, and the new developments within academic libraries. Corrall et al. (2013) discovered that many eResearch services, such as RDM, bibliometrics, and discoverability, fall within the purview of the academic library, while it could be argued that services such as qualitative data analysis and data analysis training are seldom catered for in LIS. Many university libraries see eResearch support services as a significant opportunity but lack staff skills, knowledge, confidence, and resources.

Anduvare (2019) researched the role of Kenyan PHEI libraries in supporting eResearch and stressed the importance of using ICTs in research. Using multiple-case designs involving six PHEIs in Kenya, the study found that the LIS does not have the human capacity to facilitate eResearch services (Anduvare, 2019).

Haddow and Jayshree (2017) identified individual consultations, workshops, and researcher training as prevalent library research services. In a complementary perspective, Coombs et al. (2017) proposed a Community of Practice (CoP) model, incorporating hands-on workshops and Research Data Management (RDM) presentations for comprehensive research support.

Das and Banerjee (2021) emphasised that digital research repositories are critical tools in eResearch, arguing that they improve the institution's visibility and raise its research profile. Das and Banerjee (2021) further note that copyright and anti-plagiarism advisory services have increased priority in raising awareness among researchers. Various modern tools, such as anti-plagiarism tools, such as Turn-it-in, and reference management technologies, such as Zotero and Mendeley, offer researchers support for their research.

The library website is another resource. Das and Banerjee (2021) noted that library websites are information access points that connect e-learning users to library catalogues, subscribed journal databases, electronic book collections, selected Internet resources, electronic tutorials and course materials and forums for communication and interaction with librarians. Social media can also be used as a tool for eResearch in academic libraries. Das and Banerjee (2021) also noted that LIS is increasingly being integrated into learning management systems such as Moodle, opening the door to implementing seamless on-demand services..

Xue et al. (2016) established a model for a research support service based on the research life cycle. The model propagates services such as research consultations, research guides, and workshops, processing and analysing data using library practices such as RDM, research tools, data analysis, writing assistance, publishing, and sharing through scholarly publications, open access, citation management, copyright services, and so on, and digital preservation and data maintenance by the institutional repository.

There is a paucity of research and literature on PHEIs in South Africa, including the research function of PHEIs. In addition, the literature review has revealed several gaps that are believed to hinder eResearch support in general. There is an additional need to investigate the readiness of information specialists in PHEIs to provide research and eResearch support services. The first gap relates to knowledge, views, and experiences of research and eResearch among information specialists at the PHEI. Raju (2014) examined the knowledge and skills needed for LIS specialists in South Africa to function in a digital academic library. Raju's (2014) national survey was conducted in 23 public universities and did not include any PHEI. The rationale of the study reported in this paper is to address a gap in the literature, being the status quo in PHEIs.

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Procter et al. (2013) also identified a widespread lack of knowledge to deliver sophisticated digital services, tools, and resources to facilitate and support eResearch. Support is often limited, fragmented, and not readily accessible. Although there is evidence that universities such as Stellenbosch University, University of Pretoria (UP), University of Cape Town (UCT), University of South Africa (UNISA) and Witwatersrand (Wits) have made significant progress in offering eResearch services (Chiware & Mathe, 2015), no reference is made to research capacities and support in PHEI.

Research skills can be defined as the capability to apply various statistical, technological, and theoretical knowledge in addition to some specific skills. eResearch necessitates using information and communication technology (ICT) to aid research and calls for academic and digital skill sets. This would refer to their capacity to identify, source, and use various tools. This study sets out to gauge the level of research skills in the group under study.

Research data management has become a significant challenge for researchers. Academic and research libraries are increasingly offering RDM services. Raju (2017) included eResearch competencies and skills such as metadata creation and management, library ICTs and systems operations, and research support, including Research Data Management (RDM), bibliometrics, and altmetrics, which are essential to eResearch and scholarly communication.

3 Models and frameworks form a lens guiding this study

This study was guided by a combined conceptual framework derived from the Purdue University Libraries Model (Carlson & Garritano, 2010), the eResearch Capability Model (eRCM) (Whakamuri et al., 2014), and Fernihough's 2011 Technical eResearch Framework. Carlson and Garritano (2010) explain that the Purdue University Libraries Model contains defined step-by-step procedures. The model calls for library organisational structures, assessing responsibilities, competencies, and abilities to support e-research, reorganising roles to fit researcher needs, enlisting librarians to support research, creating new jobs that permit more collaborative activities, and continuing librarian education.

Whakamuri et al. (2014) developed an eResearch Capability Model (eRCM) with eight components essential for researchers to use ICT effectively. The enlarged list of elements includes data, policies, processes, tools, collaboration, computation, mobility, and support.

In this study, the Purdue University Libraries Model (Carlson & Garritano, 2010), eResearch Capability Model (eRCM) Whakamuri et al. (2014), and Fernihough Technical eResearch Framework (2011) were used to investigate information specialists' knowledge, views, and experiences of research and eResearch; establish the existing research, research and eResearch skills and competencies prevalent among info specialists; and establish the knowledge, views.

The literature reveals significant gaps in the research and eResearch skills of information specialists within Private Higher Education Institutions (PHEIs), emphasising their crucial role in supporting research (Raju, 2014, 2015, 2017). Digital competencies focus on electronic records, metadata administration, and research data management (Raju, 2014). Conversely, Kenyan PHEI libraries face a shortage of human capacity for eResearch services (Anduvare, 2019).

In exploring eResearch support services, the literature highlights tools such as digital repositories, copyright advisory, anti-plagiarism services, library websites, and social media integration (Das & Banerjee, 2021). A proposed comprehensive research support model also addresses the research life cycle, incorporating consultations, data analysis, writing assistance, and digital preservation (Xue et al., 2016).

However, persistent research gaps exist in PHEIs in South Africa, specifically concerning the preparedness of information specialists to deliver research and eResearch support services. These gaps underscore

deficiencies in knowledge, views, and experiences within these domains (Procter et al., 2013). Procter et al. (2013) identify a widespread lack of knowledge and resources hindering the delivery of sophisticated digital services, prompting a study to assess research skills and emphasising the necessity for academic and digital competencies in eResearch. These scholarly, policy, and practice gaps motivate the current study to contribute to the understanding and enhancing information specialists' roles in research and eResearch within PHEIs.

4 Methodology

The primary goal of this study was to construct a model to improve eResearch support services within the selected Private Higher Education Institutions (PHEI). To achieve this, the initial step involved assessing the knowledge and proficiency of the information specialists under examination in eResearch. Three distinct research questions were formulated to explore the prevailing understanding and skills of information specialists concerning eResearch and its services:

- Firstly, the study sought to uncover the participants' understanding, viewpoints, and experiences related to research and eResearch. The aim was to clarify the extent to which the participants recognised and claimed specialist knowledge in these areas.
- Secondly, the research inquired about the tools, resources, and practices currently utilised by information specialists to support eResearch activities. This broad spectrum includes research data management methods, institutional research repositories, and other tools that are integrated into the eResearch landscape.
- Lastly, the study aimed to identify the existing skills and competencies in research and eResearch within the current cohort of information specialists. This question explores the skill sets prevalent among the information specialists, highlighting the capabilities and expertise within the studied group. The study was structured around these three key research questions to comprehensively explore the knowledge, tools, and competencies of information specialists in the context of eResearch, contributing to developing an effective model for enhancing eResearch support services at the chosen PHEI.

The study employed an interpretivist research paradigm. A focus group interview was used to collect qualitative data from the participants selected. Twelve (12) participants formed part of the purposive sampling. The focus group interview was conducted in an online Zoom meeting as participants were distributed geographically.

The qualitative data collected during the focus group interview were analysed using thematic reflective analysis. The thematic reflective analysis is related to phenomenology, subjectively focusing on the human experience. Thematic analysis is a technique to analyse qualitative data that entails searching for and analysing repeating patterns in data collection and reporting on them (Braun & Clarke, 2006). It is a data representation approach that involves interpretation in resolving codes and theme creation. Coding refers to the process of determining which aspects of a dataset are of interest to an analyst (Braun & Clarke, 2006). Data analysis used both a priori and inductive codes. A priori codes are pre-existing or pre-developed codes, also known as a starting list of codes, chosen for their relevance to the research questions (Johnson & Christensen, 2019). The a priori codes used to analyse the data collected were derived from the conceptual framework that guided the study. Johnson and Christensen (2019) point out that no codes should be imposed on the data, so new codes were generated inductively when data segments did not match the existing codes. In this phase, data was reduced, and the first codes were created (Attride-Stirling, 2001; Braun & Clarke, 2006). The data was coded into meaningful and manageable blocks of text such as passages, quotations, and single words (Attride-Stirling, 2001, p. 391). The selection criteria for the participants were based on whether they had a library and information science (LIS) degree and the diversity of the information specialists' geographical locations. This study involved twelve (12) information specialists.

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5 Presentation and discussion of findings

During the focus interview, discussions focused on the group's existing understandings, knowledge, and perceptions of eResearch, eResearch skills, and eResearch practices.

5.1 Level of understanding research and eResearch

Although participants displayed a basic understanding, the depth of research knowledge within the group was lacking.

> *"… knowledge and experience in research, there is a beginner, intermediate and advanced..."* [Participant B. 01:14:30.000]

> *"… most of us, information specialists, have a background or basic understanding of that component."* [Participant C. 00:03:53.000]

> *"…have the knowledge and skills to research because we can help students and lecturers access accurate and relevant information from different sources of information…"* [Participant D. 00:11:03.000]

They related research understanding typically found in traditional undergraduate information support, not eResearch. The information specialists mentioned reference interviews and electronic information searches as areas where they play a role. The essence of eResearch skills, which is the next level, did not come through clearly.

5.2 Existing eResearch services and resources

The researcher's observations unveiled that the library's comprehensive website provides information and access to various tools crucial for research support. This includes facilitating a research sample calculator and aiding researchers in determining appropriate sample sizes for their studies. Survey tools, including popular platforms like Google Forms and Survey Monkey, are readily accessible, streamlining the data collection. The library offers tools such as GNU PSPP, Jamovi stats, and Taguette for data and statistical analysis, empowering researchers with robust capabilities. Additionally, the website integrates online collaboration tools, such as Microsoft Teams, fostering seamless communication and cooperation among researchers involved in collaborative projects. Guidelines and guides on various aspects of research are available on the website, serving as valuable resources for researchers at different stages of their projects. Access to Zotero, a reference management tool, is provided to assist researchers in efficiently organising and citing their sources. To ensure academic integrity, plagiarism detection software is accessible through the library's website, allowing researchers to validate the originality of their work.

Furthermore, the website offers access to an institutional repository, providing a centralised platform for researchers to store and disseminate their scholarly outputs. In essence, the library's website emerges as a dynamic and comprehensive hub, equipping researchers with diverse tools and resources essential for the different facets of the research process. In addition, there are online subscription databases, including HeinOnline, EbscoHost, and SABINET. However, participants, except the Zotero reference manager, did not allude to being aware of or using these tools.

Academic libraries manage institutional repositories that house institutional materials such as theses, published journal articles, lecture notes, conference proceedings, and video and audio recordings. Das and Banerjee (2021) argue that research and institutional repositories are components and sources of eResearch, as they strengthen an institution's research profile and improve its visibility in the community.

In general, the information specialists lamented the lack of eResearch tools. In 2013, Procter, Voss, and Asgari-Targhi alluded to the lack of knowledge among higher education institutions about using and availing digital services to facilitate eResearch.

Das and Banerjee's (2021) contention is that copyright advisory services and plagiarism prevention services are increasingly prioritised in academic library services. Various contemporary tools are used in academic libraries, such as similarity checkers, anti-plagiarism tools such as Turnitin, and reference management tools such as Mendeley and Zotero, to name a few. This shows that information specialists recognise this critical role and use these essential tools for eResearch.

During discussions of eResearch tools that are currently used, participants shared as follows:

> *"…. the tools available on our campus, there is a general lack of the tools made available to students and lecturers. If you can check, we do not have Endnote, … many students do not have access to Endnote and Zotero…"* Participant J. 00:20:38.000]

The information specialists also highlighted using e-resource platforms through the library website. Das and Banerjee (2021) noted that library websites are information access points that connect e-learning users to library catalogues, subscribed journal databases, electronic book collections, selected Internet resources, electronic tutorials, course materials, and forums for communicating and interacting with librarians. Kumari (2015) also emphasised the importance of e-resource platforms that allow people with an Internet connection to search and get information from anywhere. As a result, e-resource databases have become indispensable to electronic content dissemination by university libraries.

As Kumari (2015, p. 151) stated, "Scholars increasingly want trouble-free access to sophisticated material, including easy access to full text and reference linking." These requirements are met by eResource platforms, allowing access to search and retrieve information. As a result, eResource databases have become critical instruments in assisting university libraries in disseminating electronic material. As one participant contended:

> *"… our institution has subscribed to EBSCOhost, Emerald, and Sabinet. So those three are the only ones I know they have subscribed to…"* [Participant C. 0:26:11.000]

The findings do not mention eResearch tools such as institutional repositories and social media and eResearch practices such as research data management, which are current trends within the information field and the research support landscape. Social media can also be used as a tool for eResearch in academic libraries. Many academic libraries maintain social networking sites like Facebook to get patron feedback, rank services and update library notices.

Although the institution has existing eResearch tools such as the institutional research repository, anti-plagiarism software, and research analysis tools, the information specialists are not actively engaged in research data management or any research support practices such as implementing, managing, and training on these eResearch tools.

5.3 eResearch skills and competencies

Research skills can be defined as the capability to apply various statistical, technological, and theoretical knowledge in addition to some specific skills. eResearch necessitates utilising information and communication technology (ICT) to aid research and calls for academic and digital skill sets. The question to be answered is whether information specialists in this study have the necessary eResearch skills and attributes to support students, staff and researchers in eResearch. Corrall et al. (2013) pointed out that while many eResearch services, such as RDM and bibliometrics, fall within the ambit of academic library services, other eResearch services fall with different departments, such as statistical and data analysis services. Many university libraries regard eResearch support services as an essential possibility but lack the necessary personnel skills, knowledge, confidence, and resources.

The level of eResearch skills and competencies prevailing among the participants studied is impaired, unstructured, and dependent on the initiative and skills of the individual. Most information specialists expressed the need for capacity development and further training. During the interview, information specialists

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exhibited skills in information literacy facilitation and basic computer skills with no evidence of research skills such as data management competencies, pedagogical skills for training, communication and collaboration with faculty, guidance on funding requirements and sources of funding, and research impact analysis.

6 Summary of Findings

6.1   Institutionalising eResearch with a focus on information specialists

The study reveals that the PHEI should institutionalize eResearch with a central role for information specialists. There is a significant gap in the reflective role of information specialists in eResearch support, necessitating a strategic reevaluation of their responsibilities. This realignment is essential for enhancing collaboration with scholars and streamlining the research process within institutions.

6.2   Fostering a deeper understanding of information specialists' role

Successful institutionalization of eResearch requires a deeper understanding of the critical role of information specialists in all phases of eResearch. The study calls for a reassessment of their duties and the creation of new roles that align with the demands of eResearch, thereby improving collaboration and enhancing the overall research experience.

6.3   Implementation of strategies for maximised benefits

The study recommends proactive implementation of strategies to maximize the benefits of eResearch tools. Developing and integrating guidelines for eResearch practices within the institutional framework ensures that both researchers and information specialists are well-equipped to engage in effective eResearch.

6.4   Creation of dedicated departments or units for eresearch support

The data supports the creation of dedicated departments or units within PHEI libraries specifically for eResearch support. These units would provide the necessary infrastructure, expertise, and assistance throughout the research lifecycle, demonstrating the institution's commitment to advancing eResearch. The PHEI might benefit by creating and organising eResearch development by following and implementing the proposed model illustrated in Figure 1.
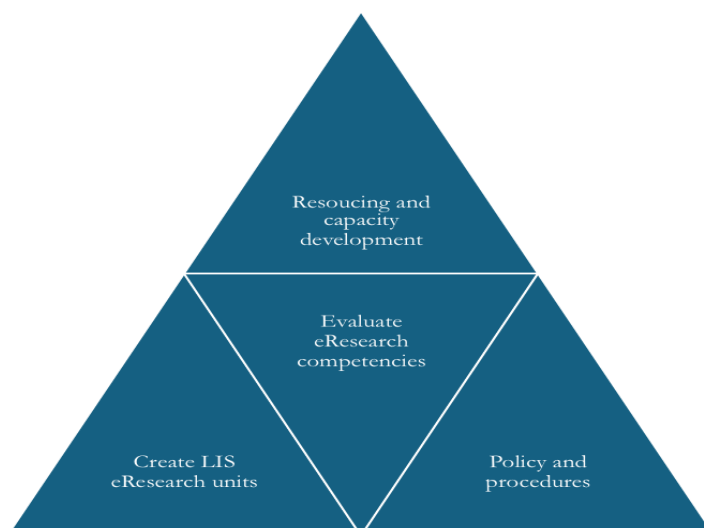
Figure 1: Model of eResearch Services and Support
Source: Pasipamire and Van Wyk (2022)

6.5   Creation of library eResearch roles and units

Restructuring organizational structures to establish specialized eResearch units or roles is essential. Information specialists should align their roles with best practices to close existing support gaps effectively.

6.6   Evaluation of eResearch knowledge and skills

The study highlights the need to assess existing eResearch resources and support functions. Developing the required skills and competencies to meet evolving research needs is crucial for enhancing eResearch support.

6.7 Development of eResearch policies

Formulating standard operating procedures and policies that align with current practices while   expanding to include eResearch support is necessary. These policies should clearly outline eResearch   capacity development plans.

6.8   Continuous eResearch capacity development

Ongoing capacity development should be based on industry standards, covering human resources, funding, tools, and infrastructure. Establishing a framework for continuous support ensures sustained eResearch development at the PHEI.

7 Conclusion

The study's findings indicated that the responsibilities and abilities needed to support eResearch were insufficient. According to the study, the PHEI has not prioritised reassigning responsibilities and improving librarians' skills to assist eResearch. Based on the study's findings about RDM assistance at the PHEI, the information specialists are not yet prepared to offer research services throughout the data lifecycle. Evidence from the interviews and observations also shows the availability of various resources, such as eResearch tools and online platforms, but inadequate organisational structures to support eResearch.

The conclusion is that the PHEI needs policies and procedures to support eResearch directly. There is a lack of understanding of the competencies and the nature of research tools. Thus, eResearch training is needed. Participants were open to establishing eResearch services. In 2011, Thomas warned that eResearch services and support would require continuous training and skills development in higher education LIS (Thomas, 2011). Later studies (see Anduvare, 2019) stressed that it is not only research-intensive universities that require support in eResearch but also PHEIs.

8 Recommendations

In fostering the integration of eResearch within the PHEI, a series of recommendations emerge, spanning scholarly, policy, and practical applications. These recommendations converge towards an overarching goal of optimising the role of information specialists and institutionalising eResearch practices. Firstly, it is imperative to recognise the pivotal role of information specialists throughout the eResearch process. The study underscores a misalignment between their current duties and the demands of eResearch support. A recalibration of their roles is thus recommended, aiming to augment collaborative research interactions with scholars and streamline the research process.

Simultaneously, to fortify eResearch at the PHEI, a strategic approach is advocated to maximise the benefits of eResearch tools. Procter et al. (2013) emphasise the necessity of guidelines for utilising instruments that support eResearch. Active engagement in eResearch practices is deemed crucial for harnessing the full potential of these tools.

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Moving beyond individual roles, the institutionalisation of eResearch through well-crafted policies assumes significance. Creating standard guidelines, with a dedicated focus on eResearch and the roles of information specialists, is pivotal. Addressing eResearch capacity development through formal and informal means is crucial, covering aspects such as research data management, ICT, staff development, and preservation, as highlighted by Anduvare (2019). Further, a dedicated strategy for eResearch support is advocated, involving establishing specific departments or units within the PHEI library. This strategy should encompass the entire research lifecyclein an eResearch setting, adapting to new service delivery models and evolving research requirements. A comprehensive review of the PHEI library's organisational structures is suggested, incorporating new services like data management.

To bridge the eResearch support gap, a restructuring of library roles is recommended, drawing inspiration from Carlson and Garritano (2010). Specialised units or roles should be created to facilitate eResearch support, involving all information specialists in this transformative process. A critical evaluation of eResearch knowledge and skills, aligned with established roles, positions, policies, and researcher needs, is proposed. As underscored by Carlson and Garritano (2010), information specialists need a diverse set of skills to provide not only traditional services but also to enhance their competencies for eResearch support. Clear eResearch policies and standard operating procedures are pivotal to guiding the reassessment and development of new roles, positions, and departments. These should stipulate required skills and competencies, facilitating a structured approach to eResearch support development. Finally, a continuous commitment to eResearch capacity development is emphasised. This involves ongoing training, learning, and relearning initiatives for information specialists, underpinned by investments in human resources, tools, infrastructure, and a dynamic approach to adapt to evolving eResearch methodologies and technologies. Together, these recommendations form a comprehensive framework to propel the PHEI towards a robust integration of eResearch in scholarly, policy, and practical realms.

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11. Managing Open Access Institutional Repositories in Higher Learning and Research Institutes in Tanzania: Prospects and Challenges

Wulystan Pius Mtega*; Grace Emmanuel Msoffe**
*Sokoine University of Agriculture, Tanzania
wmtega@sua.ac.tz

**University of Dodoma, Tanzania
gracemakenga@gmail.com

Abstract

This study was set to investigate the prospects of OAIRs in Tanzania and the challenges faced in their management. It aimed to understand the achievements and challenges in managing open-access institutional repositories in Tanzania. Specifically, the study identified the rate of growth of selected OAIRs in Tanzania, determined the level of usage of OAIRs, established factors influencing the rate of growth and sage of OAIRs and determined challenges facing OAIRs in Tanzania. The study used qualitative and quantitative approaches in answering the core research question: "What is the performance of OAIRs in Tanzania?" It purposively selected four institutional repositories to study the prospects and challenges of managing them in Tanzania. Findings indicate a low growth rate and usage of institutional repositories' contents. The stunted growth of OAIRs may be blamed for the poor visibility of institutional research outputs. It was found that the research productivity of an institution, quantity and quality of scanning tools and software, and infrastructure were some factors influencing the growth of institutional repositories in terms of content archived. This affects the usage level of OAIRs as a source of scholarly information. It is concluded that OAIRs in the country have not managed to archive most of the research outputs generated. Deliberate efforts are needed for OAIRs to archive most institutional research outputs. Such efforts may involve improving institutional OAIR policy and making it an essential component of the institutional research policy. Moreover, institutions should increase their research productivity and improve the quality of infrastructure supporting institutional repositories.

Keywords: *Open access, research productivity, scholarly communication, open access content, Tanzania*

1 Introduction

Institutional Repositories collect, preserve, and disseminate the scholarship of universities, colleges, and other research institutions. Libraries, the custodians of scholarly information, use institutional repositories to publish and showcase the institution's scholarship, including articles, books, theses, dissertations, and journals (Bankier & Gleason, 2014).

Institutional Repositories are usually among the organisation-based services aimed at serving organizational members by managing the content they create, which has to be preserved in digital form. The repositories enhance the preservation, accessibility, and usage of content. They are web-based, which makes it easy to distribute and access content.

Institutional repositories have some features that distinguish them from other online services. Usually, institutional repositories manage digital content, including text, audio, video, images, and datasets. The content may be born digital or converted into digital form through digitisation (Ilik et al., 2017). These repositories are community-driven and community-focused, as the community of users deposits content and are the authors of content-bearing copyrights (Kenta, 2023). Institutional support is critical for a

functional institutional repository because it requires adequate information and communication technology infrastructure, an institutional repository policy, and a budget for initiating, managing, and maintaining it. One of its core roles is to manage and preserve the institutional memory. This makes institutional repositories permanent, and strategies should be set to enhance their durability. Finally, institutional repositories are set to increase the visibility of organisations and content. This is made possible because most repositories are indexed by several databases, increasing the visibility of both authors of content and organisations hosting the repositories.

1.1   Software for institutional repositories

There are several software packages used for institutional repositories. Each software package offers different features and functionalities. These software packages for institutional repositories may be commercial, shareware, freeware, or free/open-source software (Kenta, 2023). For commercial (proprietary) software, a user has to purchase rights to use the software. The user has to pay for its purchase, maintenance, and improvement. When using proprietary software, a user cannot modify the software; the developer has all privileges.

Shareware Software is freely downloadable and then used for trial purposes. A user has to pay for the ultimate use of the software. The developer of shareware software keeps complete control of the intellectual property rights. This means the user cannot access source codes and thus cannot modify the software. Like commercial software, users' collaborations are not included in the shareware software.

Freeware Software can be downloaded, used and copied without restrictions. However, the user has no access to the source code, no community, no development, and no improvement can be possible (Kenta, 2023). The other type of software for institutional repositories is Free/ Open-Source Software (FOSS). It grants users the rights to use, copy, study, change, modify and improve its design as users can access the source code. DSpace and EPrints are among the most commonly used open-source software.

1.2   Open access institutional repositories

Open-access institutional Repositories (OAIRs) contain a collection of full-text documents available in online databases that are freely accessible by users. They promote scholarly communication and enhance free access to full-text documents (Muneja, 2017). OAIRs also promote the archiving of local content within an institution. Their presence enables the accessibility of local content whose visibility was previously limited to those visiting physical collections in libraries.

The benefits of OAIRs have promoted the adoption of these repositories in different academic and research institutions. These repositories enhance the visibility, accessibility, and free usage of local content (Lee-Hwa et al., 2013). They also increase the online visibility of content, institutions, and researchers (Marsh, 2015) and enable the long-term preservation of archived content (Wirba Singeh et al., 2011).

Globally, the existence of OAIRs can be traced back to the 19190s, when Gardner first proposed an archive of academic publications for one of the journals (Bangani, 2018). In Africa, OAIRs were introduced in 2000, and South Africa is recorded to have the first repository. The first OAIR was established in East Africa in 2006 at Makerere University in Uganda (Kakai et al., 2018).

1.3   Open access institutional repositories in Tanzania

The Open Access Institutional Repositories initiatives in Tanzania started in 2009, and the first repository was established at the University of Dar es Salaam (Muneja, 2017). After establishing the first repository, other academic and non-academic institutions adopted the open-access mode for publishing their research outputs. In 2023, Tanzania will have 19 OAIRs; 16 will be university-based, while the other three will be from non-university institutions (OpenDOAR, 2023).

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Most of the OAIRs in Tanzania have a policy to guide their implementations. Most policies have included issues on intellectual property rights, roles of different actors, accessibility and preservation of content, and funding and sustainability of institutional repositories (Sokoine University of Agriculture Institutional Repository Policy, 2014). In most cases, implementing an institutional repository policy leads to an increase in the contents. In Tanzania, the number of OAIRs has been increasing over the years; however, the amount of content per repository has remained low (DOAR, 2023). Findings from Ndiango, Kumburu and Jaffu (2023) indicate that researchers from different institutions in Tanzania conduct research and that research publications form the first research outputs (Ndiango et al., 2023a). Thus, this study is set to explore the prospects and challenges of OAIRs in Tanzania.

1.4   Objectives of the study

The study's general objective is to investigate the prospects of OAIRs in Tanzania and the challenges they face in their management. Specifically, the study is set to:

- Identify the rate of growth of selected OAIRs in Tanzania.
- Determine the level of usage of OAIRs in Tanzania.
- Establish factors influencing the rate of growth and sage of OAIRs.
- Determine challenges facing OAIRs in Tanzania.

The study is set to answer the general research question: "What is the performance of OAIRs in Tanzania?"

2 Literature review

Open Access Institutional Repositories (OAIR) are at the core of archiving institutional research outputs. They are set to enhance the visibility, availability and accessibility of institutional research outputs (Ezema & Eze, 2024). OAIRs are there to preserve institutional memory as they preserve research outputs generated by the university. They form a unique model of scholarly communication that benefits the researcher, the institute from which the research is affiliated, and the user of scholarly information. They enhance access to scholarly content that could be shelved in libraries as physical publications. Because they preserve research outputs in electronic format, the visibility of preserved contents is always higher than in print format. Due to increased visibility and being freely accessible, the level of usage of content from OAIRs is usually higher as they break down challenges brought about by differences in geographical locations and time (Bashir et al., 2021). Major content indexers index most OAIRs and become easily visible when one searches for scholarly information (Wheeler et al., 2022). This increases the visibility of the content, the institute hosting the repository, and the researcher who authored the open-access content. Users could not have managed to access the content if it had not been archived and preserved. On the side of the content, institutional repositories play a crucial role as they preserve such content.

Since OAIRs provide open-access content, the level of usage of such repositories is expected to be high. A study by Kodua-Ntim (2022) indicates that usage of OAIRs is primarily indicated by either the level of downloads or uploads of content in the OAIR. Koduo-Ntim further mentions that user experience and the design of the user interfaces play a crucial role in enhancing the level of usage of OAIRs. Moreover, the availability of archiving services and automatic harvesting enhance the repository's growth while advocacy and marketing create awareness among community members of the repository and the open contents. Therefore, accessing contents from the repository depends on user awareness of the open access repository, the availability of the contents and the relevancy of the contents to user needs, but the uploading contents into the repository is influenced by the availability of the archiving service and the presence of self-harvesting option in the repository software application.

Managing the open-access institutional repository depends much on the open-access institutional repository policy. It is the policy that sets the scope of the repository, and it provides some guidelines

on how to develop and use the collection (Callicott et al., 2016). The policy sets the scope for collection development, access restrictions, deposit agreements, preservation, rights of the depositor, and how to withdraw content. (Kati, 2020). The policy helps ensure that the OAIR collection reflects and strengthens the institute's research agenda (University of Otago, 2016). Thus, effective management of institutional repositories depends much on policy.

Despite having a good policy for guiding the management of institutional repositories, the usage level may face several challenges. Studies (Saliu et al., 2022; Dlamini & Snyman, 2017) indicate that such challenges may be financial, individual, infrastructural, managerial, technical, or legal. Common challenges include funding, plagiarism, lack of global accessibility, unreliable power supply, copyright issues, lack of incentive, lack of will to deposit, lack of awareness and low bandwidth (Saliu et al., 2022). Other common challenges may be on the institutional repository management side, including poor policy quality, outdated institutional repository application software usage, and inadequate technical expertise for effective repository management (Dlamini & Snyman, 2017). Generally, OAIR should reflect the institutional research agenda. It is thus essential to effectively preserve all research outputs generated in the form of publications for preservation and reference by community members. The repository should depict and market the institution's memory by showing its capacity to research and generate knowledge.

The growth rate of OAIRs in Tanzania is low (DOAR, 2023), so it is essential to understand what limits their growth and recommend possible remedial measures. Several factors influence the growth rate and usage of OAIR (Saliu et al., 2022). However, the factors differ from one country to the other as they are contextual. It is thus essential to have a clear understanding of the factors influencing the growth and usage of OAIRs in Tanzania. Again, several challenges are faced in using and managing OAIRs (Dlamini & Snyman, 2017). studies indicate that most of the challenges are homogenous to institutions in a given country Studies (Saliu et al., 2022; Dlamini & Snyman, 2017). It is thus essential to understand possible challenges in the Tanzanian case and recommend possible remedial measures.

3 Research methodology

This study investigated the prospects of OAIRs in Tanzania and the challenges faced in their management. It was set to find an answer to the critical research question, "*What is the performance of OAIRs in Tanzania?*" The study's population was 19 OAIRs from Tanzania registered by the Directory of Open Access Repositories (DOAR, 2023). It used qualitative and quantitative research approaches to answer the research question.

The study purposively selected OAIRs meeting the three inclusion criteria as follows: (1) institutional repository policy, (2) a repository should have at least ten years since its establishment, (3) it should be from an institution actively involved in research, and (iv) should provide access to full-text. Based on these criteria, the Muhimbili University of Health and Allied Sciences Institutional Repository (MUHAS IR), Mzumbe University Institutional Repository (MU IR), Sokoine University of Agriculture Institutional Repository (SUA IR), and the University of Dodoma Institutional Repository (UDOM IR) were purposely selected for the study.

The study used different approaches to collect data. A quantitative content analysis was used to collect data on institutional repositories' growth rate for the first specific objective. The second specific objective is to determine the level of usage of institutional repositories. The study used a quantitative approach to identify publications that cited IR content. A search within reference option of the Scopus database advanced feature was used. The Universal Resource Locator (URL) for each selected repository was used as a search term in the Scopus reference search tool. This was done as citations made from online sources, usually including Institutional Repositories, contain a URL in the reference section. Studies published from 2018 to 2022 were involved in the study. The five years were chosen as it was considered that institutions become familiar with the management of institutional repositories.

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Data were collected through in-depth interviews with institutional repository managers for the third and fourth specific objectives. Moreover, a documentary review involving a content analysis of institutional repository policy was conducted.

4 Findings and Discussion

The study involved OAIRs from four universities: the Sokoine University of Agriculture, the Muhimbili University of Health and Allied Sciences, the Mzumbe University, and the University of Dodoma. The four institutions are all public universities offering their services mainly to their university communities. However, the contents of OAIRs are open access and can be accessed in full-text by anyone.

4.1 The growth of the selected OAIRs

The study aimed to establish the growth rate of the four institutional repositories. The growth rate was measured by the number of contents uploaded per year. Findings in Table 1 indicate that the OAIRs were established in different years, and their age ranged from four to 11 years. Findings also indicate that SUA IR had the largest number of contents, followed by MUHAS IR. In terms of growth, UDOM IR was found to have the highest growth rate, followed by SUA IR. UDOM IR uploaded an average of 907 pieces of content in a year, followed by SUA IR, which uploaded 663.

Table 1: The growth of selected OAIRs

Name of IR	Year established	Current Age	Number of contents	Average annual growth	Annual growth rate
SUA IR	2015	8	5301	663	13
MUHAS IR	2012	11	4568	415	9
UDOM IR	2019	4	3628	907	25
MU IR	2013	10	3310	331	10

Findings indicate that UDOM IR grew by 25% in a year, SUA IR by 13%, MU IR by 10% and MUHAS IR by nine per cent. These findings imply that the growth rate of the institutional repository is not influenced by its age but rather by the content upload rate. In Tanzania, the University of Dodoma is considered the largest university in terms of students and staff (UDOM, 2023) compared to The Sokoine University of Agriculture, which has less than 500 teaching staff (SUA, 2021).

Moreover, the growth of an institutional repository may be influenced by the type of content allowed to be uploaded. DOAR (2023) depicts that the content type differs by institutional repository. Institutional repositories with more content types are likely to have a greater growth rate than those with fewer content types. Moreover, institutional repositories that are discipline-specific may have a low growth rate when compared to those which are not discipline-specific. It is for the same reason that two institutional repositories (the Tanzania Climate Change Information Repository (TaCCIRe) and SUA IR) managed by the same university differ significantly in terms of growth (DOAR, 2023).

4.2 The level of usage of OAIRs in Tanzania

The study was also set to establish the usage level of institutional repository contents. Usage of contents from institutional repositories is one way to justify their importance. Citations justify the usage of scholarly information. Findings in Table 2 indicate that 97 publications cited contents from the four institutional repositories. Findings show that the majority of the publications cited contents from SUA IR ((47%) followed by MU IR (25%), while few cited contents from UDOM IR (08%).

Table 2: Frequency of citations from selected OAIRs in Tanzania

YEAR	FREQUENCY OF CITATION				Total
	SUA IR	**MU IR**	**MUHAS IR**	**UDOM IR**	
2018	1	2	2	0	
2019	3	3	5	0	
2020	5	6	3	0	
2021	15	5	4	2	
2022	22	8	5	6	
Total	46 (47%)	24 (25%)	19 (20%)	8 (08%)	97 (100%)

Findings in Table 2 imply that the usage of contents from institutional repositories, as evidenced by citations, differed by institutional repository. To some extent, the institutional repository's age influenced its usage level (refer to Table 1). Moreover, content indexed by Google is most used as more researchers and scholars prefer it to others (Samadzadeh et al., 2013). Google points out that a repository is well indexed when all its articles are reached through links from the home page, have good metadata, and have a maximum size of five megabytes (Luyten, 2019). Based on these facts, institutional repositories should improve their metadata and adhere to the guidelines of major indexing databases to increase the visibility of their content.

Institutional repositories archived journal articles, conference papers, books/book chapters, and dissertations/theses. This indicates that 47% of the citations from institutional repositories were for journal articles, while 23% were for conference papers. Findings indicate further that few citations were for dissertations/theses (18%) and books/book chapters (18%), respectively.

The findings imply that users preferred some institutional repository contents to others. These findings are in line with others, which show that, in most cases, journal articles are the most used content (Gohain & Saikia, 2014).

The findings in Table 3 show the citations by institutional repository content over five years. They indicate that the number of citations for each institutional repository content type increased over the years.

Table 3: OAIRs used by content type

Content type	Frequency by Year					Total
	2018	**2019**	**2020**	**2021**	**2022**	
Journal article	3	5	7	13	18	46
Conference papers	3	4	4	6	5	22
Book chapter	2	3	1	2	4	12
Dissertation/theses	3	2	3	4	5	17

The increasing number of citations from the different institutional repository contents may be due to the gradual increase in their visibility. It may also be due to the gradual increase in community members' awareness of the institutional repositories.

Factors influencing the rate of growth of OAIRs

Key informant interviews were used to determine factors influencing the growth and usage of OAIRs. Findings indicate that factors influencing the rate of growth of institutional repositories include the following:

4.3.1 Research productivity of an institution

Academic libraries collect research outputs in the form of publications from researchers. When institutional research productivity is high, the amount of content received for archiving onto the repository is usually

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high, and if productivity is low, fewer contents will be generated (Ladipo *et al.*, 2022). Only contents published by university community members were acquired. This is the rate of archiving local content into institutional repositories.

4.3.2 scope of institutional repositories

It was also found that some institutional repositories were subject/discipline-specific. An example of the Tanzania Climate Change Institutional Repository (TaCCiRe) from the Sokoine University of Agriculture is that the rate of its growth has been low because it is subject-specific. The repository manager at the Sokoine University of Agriculture said, "*It takes a long time to receive content relevant to the discipline; for this reason, the repository's growth rate is low*". It is, therefore, essential to have a community for a specific discipline/subject rather than setting a repository for it.

4.3.3 quantity and quality of scanning tools and software

Respondents were asked about the tools they used for scanning. Responses indicated that not all institutions had an adequate number of tools. Moreover, the quality of tools differed by institution. The adequacy and quality of scanning tools and software influenced the quality and quantity of the outputs and, hence, the growth of the institutional repositories. This is in line with Akpokodje and Akpokodje (2015), who found that the adequacy of content scanning and uploading tools play a vital role in the growth of an institutional repository.

4.3.4 Ability to use scanning tools and software

Libraries in some universities have extensive collections of research reports for conversion into soft copies. The ability to use scanning tools and software influences the conversion rate of hard copies into soft copies. One key informant interviewee said, "*It is not easy to be fast in scanning because I do not have adequate skills and experience to do the job. I can scan it, but editing the scanned content makes the work more difficult.*" Digital skills form an essential qualification for those working with repositories. Learning to use the hardware and software to scan and upload content is essential.

4.3.5 Content format

Contents can be in hard copy or soft copy. When they are received as hard copies, conversion to a softcopy must occur before digital archiving. This wastes much time and affects the repositories' growth rate. A repository manager from one institutional repository said, "*The growth of our institutional repository will increase quickly now as most of the content we receive is in digital form. We do not have to waste more time scanning; for most content, we enter the metadata and upload the content. Dealing with digital content makes the whole work easy*". Institutional repository policy and other scholarly institutional policies should promote digital content creation instead of hard copies.

4.3.6 infrastructure

During key informant interviews, all four managers mentioned that Internet connectivity, availability of power, and other essential ICT tools influence their repositories' growth rate. Frequent power cuts affect scanning and uploading contents as repositories use power-dependent tools. Moreover, adequate Internet connectivity and bandwidth are essential when uploading content to repositories. Furthermore, two of the four repositories were down for a week during the study period. Managers mentioned that the repositories were offline due to some faults experienced. It was found that the two repositories did not have backups. This might be one of the reasons for their low usage.

4.3.7 visibility of contents

Universities collect theses and dissertations from students and archive them in their institutional repositories. In most cases, their sizes go beyond five megabytes. Google Scholar does not index content over five

megabytes (Luyten, 2019).

4.3.8 Metadata

Descriptive metadata influences the visibility of contents. The quality of metadata influences the visibility and, hence, the usage of content from institutional repositories (Kristensen & Kirk Sørensen, 2023). Findings indicated that some of the metadata from some repositories were poor. This was one of the reasons for the low usage of content from institutional repositories.

Therefore, the growth of institutional repositories is influenced by both individual and institutional factors. Individual factors include individual competencies to use tools for scanning and uploading content. Institutional factors include infrastructure, power, Internet connectivity, institutional repository policies, and hardware and software availability.

4.4 Challenges facing OAIRs management

Findings from key informant interviews revealed that challenges limiting the growth and management of OAIRs were related to infrastructure, legal issues, and the individual willingness of researchers to contribute content to OAIRs.

4.4.1 Infrastructural inadequacy

Key informant interviews revealed some infrastructure-related challenges that limit the growth of OAIRs. These challenges included unreliable power supply, poor Internet connectivity and low bandwidth. Others include inadequate numbers, low-quality hardware and software for scanning and editing, and a lack of backups. The state of the required infrastructure strongly influences the growth and management of institutional repositories (Okoroma, 2018). Adequate infrastructure is required for the growth of OAIRs.

4.4.2 Individual digital incompetence

Digital competencies play a vital role in the usage of digital tools. Key informant interviews revealed that some of the staff involved in different processes of institutional repository management were not competent. It was found that they lacked competencies in using tools for scanning, editing software, and metadata generation. The lack of the required competencies negatively influenced the growth and visibility of the institutional repositories.

4.4.3 Legal factors

It was also found that issues related to copyrights limited the growth of OAIRs and the open access movement in general. Copyrighted contents were embargoed, which was against OAIRs' open access policy. It was reported that most journal articles indexed in institutional repositories were published under closed access by commercial publishers, and OAIRs had to make only abstracts visible. This could limit the usefulness of OAIRs among those who need full texts.

4.4.5 Low willingness to self-archive contents

It was reported that only a few researchers were willing to self-archive the publications. The majority were to be requested to submit copies of their publications. Low willingness among researchers to submit content is accounted for limiting the growth of the institutional repository (Mbughuni et al., 2023).

4.4.6 Low research productivity

It was reported that the library acquired a few local contents from institutional researchers. It was reported that the number of researchers authoring publications from the university was low. When the rate of generation of local content is low, the rate of growth of institutional repositories becomes low (Amponsah et al., 2021).

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5 Conclusion

The rate of growth of institutional repositories in Tanzania is still low. The low growth has resulted in low content in institutional repositories. To a great extent, the low level of growth in institutional repositories in the country is due to a low level of archiving due to low research productivity and failure to archive all publications generated through research activities in the country. The low number of content in institutional repositories has failed information seekers who need access to local content. It is, therefore, essential to set strategies for arching all local research contents and strengthen research productivity to increase the quantity of research outputs. Both individual and institutional factors and challenges limit the usage of institutional repositories. Awareness creation. Improving OAIR policies, bandwidth, and metadata may help to increase the visibility and usage of OAIRs' content.

6 Recommendations

It is important to archive all publications generated to increase the growth rate of institutional repositories. It is also recommended that a strong link between the library that manages the institutional repository and the faculties that generate content be created. Adopting an automatic harvesting application in the repository application software is also recommended. This may enhance the continuous growth of the repository. Researchers should also be trained on self-archiving their publications; this may be an essential strategy to ensure that all contents generated by the institution are archived. For this to occur, it is essential to improve all necessary infrastructure influencing the operations of institutional repositories. Thus, a repository should have adequate and quality hardware, software, power supply, and bandwidth. Its policy also recommends that OAIRs be revisited and reviewed occasionally to cope with technological, societal, and political changes. On the other hand, it is crucial to strengthen the competencies of staff working with repositories so that they may have the needed skills for managing the repository and ensuring that it serves the local information needs of users.

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12. Integrated Information Governance Framework for Air Traffic Navigation Services in South Africa

Refiloe Mabaso

Air Traffic and Navigation Service

refiloema@atns.co.za

Abstract

Information governance (IG) provides a broader approach to the management and governance of organisations' data and information. The present study reveals that the Air Traffic and Navigation Service (ATNS) creates enormous amounts of data and information that is not adequately managed and governed. ATNS provides safe, cost-effective air traffic management solutions. However, information assets are fragmented and inconsistently streamlined and integrated. This study sought to develop an integrated IG framework for ATNS, allowing the organisation to manage and govern its information. The study objective guided the data collection through interviews of fifty-two (52) ATNS employees, observing the organisation's information management and governance and analysis of strategy documents and annual reports. The study revealed that there is interest in implementing IG in the organisation to ensure information safety, security, and access to information, reduce legal risk, improve compliance, meet regulatory and business requirements, reduce information duplication and effectively inform decision-making. The significant finding was that some IG facets, including records management, knowledge management, data analysis and business intelligence, are already in place while recognising that IG facets and efforts are not centralised. The study concludes that the IG framework for ATNS presents the first-of-its-kind integrated IG framework. The researcher acknowledges that IG facets exist in different forms, but thus far, no integrated IG framework is in place. Therefore, it is recommended that ATNS implement and integrate the facets of the IG framework, which include IG infrastructure, roles and responsibilities, legislative framework, policies, and standards.

Keywords: *Data management, information management, records management, knowledge management*

1 Contextual background

The contextual setting of this study is Air Traffic and Navigation Service. ATNS is an air navigation services provider (ANSP) governed by South Africa's legislative and administrative framework. It plans, manages, and operates safe and efficient airspace services and provides air traffic management solutions and associated services. The South African government, through the Ministry of Transport, is the sole shareholder, according to the ATNS Act No. 45 of 1993. (Act No. 45 of 1993). ATNS is also classified as a Schedule 2 Public Entity under the Public Finance Management Act (Act No. 1 of 1999) by operating in a highly regulated environment governed by national and international regulators, policies, and standards (ATNS 2019). The Air Traffic and Navigation Services Company Limited was founded in 1993 under the Air Traffic and Navigation Services Company Act, 1993 (Act No. 45 of 1993), overarching by the International Civil Aviation Organisation (ICAO), Standards and Recommended Practices (SARPs) and South African Civil Aviation Authority (SACAA) Regulations and Technical Standards (ATNS 2019). ATNS operates in a highly regulated environment governed by national and international regulators, policies, and standards (ATNS 2019). This regulatory arrangement elevates the role of information governance as critical in improving organisational performance and operational efficiency, reducing the risk of losing critical information, and promoting professional competency protection. The growing complexity of the global air transportation system and interconnected aviation activities necessitate a firm assurance of aircraft safety, support for safety management provisions, and proactive strategy development to improve safety performance (ICAO.int, 2020). For ATNS to provide safe and efficient air traffic management solutions,

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it requires, among others, the implementation of an information governance framework. In performing its mandate, ATNS produces a volume of information that supports projects, financial activities, and other functions of the organisation. The information needs to be appropriately governed from creation to disposal according to required information, archival legislation, and international best practices. Failure or inadequacies to govern information can expose ATNS to potential risks related to legal and regularity obligations, continuity of business operations, and accountability to shareholders.

This study aimed to develop an integrated information governance framework for ATNS. The purpose of the study is to develop an integrated IG framework that is specific to ATNS. ATNS, as a state-owned organisation, has the responsibility of ensuring that the organisation's information is managed and governed in a secure and accessible manner. A sound IG framework is a critical foundation enabling the organisation to govern and properly manage its information. It provides accountability for effective and efficient information usage to meet organisational objectives and compliance needs.

2 Literature review

This research aims to provide an integrated IG framework for ATNS. IG is a subset of corporate governance, with a critical focus on records management, content management, information governance and data governance, information security, data privacy, risk management, litigation readiness, regulatory compliance, long-term digital preservation, and even business intelligence comprises IG, according to Smallwood (2014).

According to Lederman (2012), the IG framework is a strategic framework that takes a holistic approach to managing information. It includes standards, processes, roles, and metrics that hold employees accountable for effectively creating, organising, securing, maintaining, and disposing of information in support of the organisation's goal. The IG framework's goal is explicitly outlining a strategy for the administration of IG. The framework is a descriptive methodology that describes the successful management and utilisation of information resources that support the execution of IG.

According to McManus (2004), measurable and strategic goals that benefit the organisation at all levels must be included when creating an IG framework. These objectives include promoting information as an asset, information education and awareness, and creating cost-effective, scalable, and accessible information systems. They also involve management accountability, information risk, and ethical standards. The anticipated results also include fostering cooperation among information users, advancing use standards, creating business alliances among information users, and fostering trust within the more significant information society.

Incorporating information quality and protection of information life cycle management in support of an organisation's strategy, operations, regulatory, legal, risk, and environmental requirements, the IG framework is a comprehensive approach to managing and leveraging information for business benefit (Ragan, 2013). Several IG frameworks have been established to solve issues with information management and ensure that the production, storage, usage, archiving, and destruction of information, as described by Gartner (2009), are correctly managed and followed in attaining the organisation's goals. The following IG frameworks were chosen and examined to analyse and assess their emphasis in connection to the purpose of this study, as shown in Table 1.

Table 1: Existing industry frameworks

Framework	Focus or perspective of the framework
COR Concepts Information Governance Framework	Adopts an integrated approach to IG, highlighting four pillars: critical success factors, structure and instruments, principles and disciplines (Mullon, 2017).

Framework	Focus or perspective of the framework
Corporate Governance using the King IV Code of Corporate Governance and ISO 38500	It emphasises the need for information and technology governance but does not provide detailed guidance on IG implementation. It provides the corporate governance requirements emphasising IT governance as if the concept embraces the wider IG (Ngoepe, 2012).
Association of information and image management (AIIM) information governance	AIIM provides a framework for enterprise content management (ECM) and provides certification on IG but does not provide a single framework or model (aiim.org, 2020).
ARMA principles and IG Maturity model	The primary focus is on records management, aligned to the electronic discovery reference model (EDRM) e-discovery IG framework. IG activities are considered in accordance with eight principles: accountability, transparency, integrity, protection, compliance, availability, retention, and disposition (Janah & Mayesti, 2020).
ARMA information governance body of knowledge (IGbok)	ARMA International defines information governance (IG) as a "strategic, cross-disciplinary framework composed of standards, processes, roles, and metrics that hold organisations and individuals accountable for the proper handling of information assets (arma.org 2020)
Electronic discovery reference model (EDRM)	EDRM focuses on e-discovery by identifying, capturing and governing all information. It was adopted by both ARMA (where it is aligned with the generally accepted recordkeeping principles) and the Compliance, Governance and Oversight Council (CGOC) (edrm.net 2020).
Information governance reference model (IGRM)	IGRM outlines a framework that promotes policy and process integration across information stakeholders, mainly business, legal, Records and Information Management (RIM), security, and privacy (edrm.net 2020).
IT governance models, With COBIT (2019) As an initial reference point	Smallwood (2014) explains that COBIT consists of detailed descriptions of the processes required and the tools to measure progress toward maturity of the IT governance programme. It focuses on IT governance, with awareness of the need to govern information as a core element. COBIT 2019 covers audit and awareness assurance, risk management, information security, regulations and compliance, IT operations, IT governance, and value from IT investments. IG is highlighted in the framework to close the link and align between IT governance and information governance (isaca.org 2020)
Information Governance Initiative (IGI) model	The focus is on a multidisciplinary approach, and valuable research was conducted to determine which disciplines could be part of an IG framework. It defines IG as the activities and technologies people use to maximise the value of their information while minimising associated risks and costs. IGI is a think tank and community that advances the adoption of IG practices and technologies through research, events, advocacy, and peer-to-peer networking (Mullon & Ngoepe, 2019).
IBM Information Governance Maturity Model (CGOC)	The compliance, governance, and oversight council (CGOC) evolved from IBM data governance. CGOC has adopted the EDRM Information Governance Reference Model (IGRM). It is a community that covers areas such as legal, it, privacy, records and information management (rim) professionals from corporations and government agencies, focusing on data governance (cgoc.com, 2020).
DAMA dama-dmbok2 Framework for data governance	DAMA (Data Management Association International) is widely known and acknowledges the DAMA Guide to the Data Management Body of Knowledge (dama-dmbok2). The terms "data governance" and "information governance" are used interchangeably in their preamble and definitions. The guide promotes the understanding, development, and practice of managing data and information as critical enterprise assets to support the organisation's strategy (dama.org 2020).

Managing an organisation's information to maximise the value of information as an asset and decrease the risk of information loss is the common theme running through all of the IG frameworks. The IG frameworks apply to all corporate information regardless of format, purpose, or location. By defining

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policies and processes for handling corporate information, IG frameworks help organisations evolve and transform. According to Gartner (2020), an IG framework has the following advantages: improving organisational value, managing information effectively, cost-effectiveness, customer service, competitive advantage, and increased revenue. Adopting an IG framework in an organisation should be a complete strategy to make coordinated, proactive information choices that benefit the organisation, satisfy information-related needs, manage risks, and maximise value.

An extensive analysis of information-related behaviours, needs, risks, and possibilities should be the foundation for an IG framework's strategic goal. The general goal of the IG framework should be to guarantee that data utilised for various purposes within the organisation is accurate, trustworthy, and dependable and that it is available in formats that can be used by many platforms or applications (Sedona, 2019).

This study uses the COR Concepts IG Framework, created by Mullon (2017). Several organisations, notably the Reserve Bank of South Africa and the eSwatini Revenue Authority, have adopted Mullon's IG structure (Mullon & Ngoepe, 2019). As shown in Figure 1, the framework is built on four fundamental pillars: major success factors, structure, instruments, principles, and disciplines (Mullon, 2017).
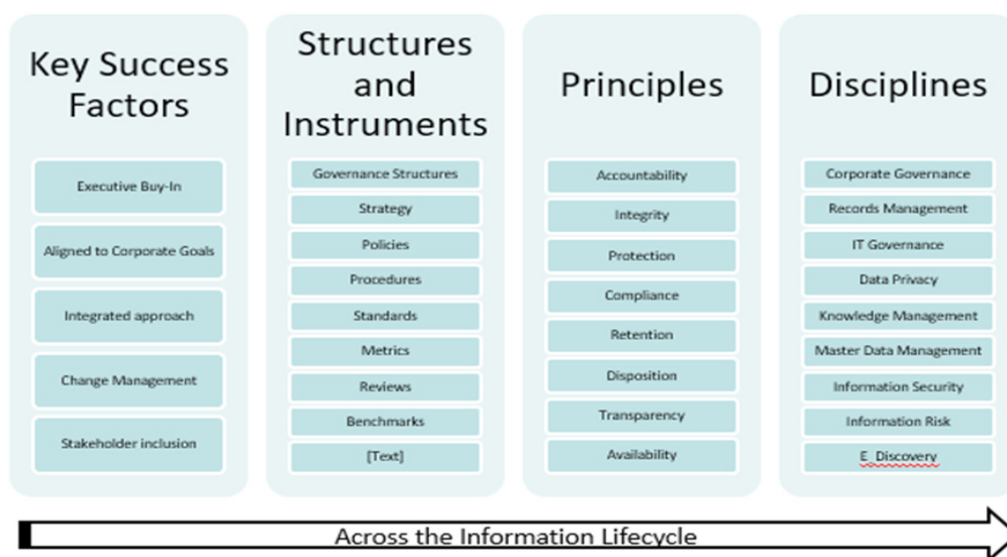
Figure 1: COR concepts integrated information governance framework

According to Franks (2018), information is a crucial resource for the company, and information governance (IG) is an integrated, strategic approach to managing, processing, regulating, archiving, and retrieving information as proof of business activities. IG offers a framework for information management's conversive aspect. A comprehensive IG framework that frames IG as a coordinated endeavour is highlighted by Bennett (2020). Figure 2 shows the IG components that coordinate people, processes, technology, and policies in an integrated manner. Each component serves a specific role, and when combined, they provide life-supporting systems that enable critical processes to overlap, interact, and depend on one another to sustain interdependencies. An integrated IG framework provides a unified and thorough strategy.

Figure 2: IG elements

A unique, comprehensive, and integrated approach to information governance (IG) has been created by COR Concepts that goes beyond IT governance and records management. Information governance based on the Generally Accepted Recordkeeping Principles Framework (GARP), records management governance based on alignment of policies and procedures, governance structures, alignment of information to corporate governance, privacy, freedom of information, access to information, quality, metadata, master data management, risk management, and information security are all included in the approach (Corconcepts, 2020). IG is a comprehensive approach to numerous systems that promote high-quality and secure information exchanges, including ensuring that information effectively and efficiently supports business aims.

Implementing effective IG practices in an integrated manner necessitates an enterprise-wide, cooperative effort. The knowledge and abilities required to analyse and assess the value of an organisation's information and governance cannot be confined to one person or department. Such IG initiatives may be redundant, at odds with one another, and ultimately futile if an IG project has an integrated strategy that must be effectively addressed (Braman, 2012).

Bennett (2017) emphasises that an adequately implemented integrated approach for an IG programme with appropriate leadership should deliver adequate security and control of information by minimising risk, reducing costs of holding information, maximising the value of information contained by the organisation, and delivering constant strategic and proactive governance. According to Goodman (2018), an adequately integrated IG approach will align with the organisation's strategy, improve legal, regulatory, and policy compliance, decrease risks, boost cost-effectiveness and efficiency, and improve competitive advantage by effectively using information assets. Business consensus on the ideal IG goal state and methods for organising, designing, creating, implementing, and maintaining an integrated IG programme.

According to McCollum (2013), the emerging discipline of IG, a framework for accountability that considers people, processes, policy, and technology, validates the importance of effective information management for an organisation to successfully carry out its business plans and strategic goals.

3 Methodology

The study investigated the development of an Integrated Information Governance Framework for ATNS. Based on the interpretivism research paradigm, this ethnography study used COR Concepts Consultancy's Integrated Information Governance Framework as a theoretical lens (Creswell, 2014). The study sample was purposively selected from Air Traffic and Navigation Service (ATNS) employees of various levels

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within the organisation. Data were collected through interviews, document analysis, and observation as the researchers were involved in some of the organisation's projects.

The study adopted a qualitative case study to collect and analyse data. According to Baxter and Jack (2008), the goal of a qualitative single case study is to guarantee that the subject of interest is thoroughly investigated and that the phenomenon's core is made clear. Quinlan et al. (2015) emphasise that case studies are beneficial for conducting in-depth analyses of bounded entities, such as organisations or specific incidents or events.

4 Findings of the study

According to Ragan (2013), an IG framework is a holistic approach to managing and leveraging information for business benefit. It encompasses information quality, protection, and life cycle management in supporting an organisation's strategy, operations, regulatory, legal, risk, and environmental requirements (Ragan, 2013). On the contrary, the study's findings are that ATNS currently does not have an IG framework, and there is no short-term nor long-term plan to develop an IG framework. Various activities are developed and delivered as a silo approach that could contribute to the IG framework. The IG framework provides accountability that enables organisations to create, store, use, and dispose of information by regulatory, legal, risk mitigation, and business workflow requirements.

The study determined that ATNS, as a state-owned entity, is responsible for ensuring that organisational information is treated as an asset and managed and governed to meet the minimum compliance requirements. The conception of an IG framework is crucial for addressing information management deficiencies. Figure 2 below presents the proposed Integrated IG framework for ATNS.
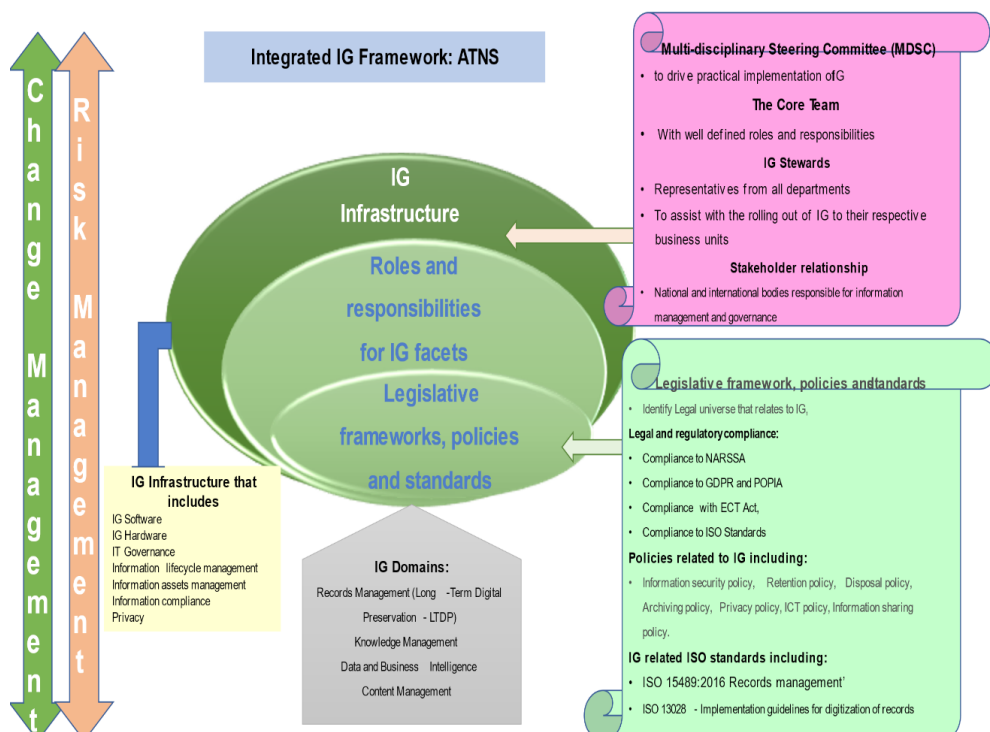
Figure 2: Proposed Integrated IG framework for ATNS

4.1 IG Legislative frameworks, policies and standards

ATNS must comply with the regulatory universe affecting the organisation's operations, which includes information governance requirements. To deliver business value, IG seeks to align business objectives with organisational strategy. The emphasis on legislative frameworks, policies, and standards is to ensure compliance and that the organisation adheres to relevant laws, regulations, and internal policies.

Electronic discovery (e-discovery) readiness, records and information retention policies, legal hold notification, and legally defensible disposition practices are all essential legal processes that govern the preservation and discovery of records and information in a legal proceeding. The alignment and implementation of policies and standards should support and drive the desired future behaviour of information governance. This ideal can be achieved in the medium term.

4.2 Roles and responsibilities of IG

It is essential to agree on, define, and formalise the roles and responsibilities of ATNS's IG function. Without well-defined IG roles and responsibilities in the organisation, there will be no successful implementation of an IG programme. The following are the roles and responsibilities:

- A Multidisciplinary Steering Committee (MDSC) was formed to make critical decisions for IG. It is expected to meet regularly and will be empowered to make and enforce some critical information governance decisions. The committee should include senior-level managers from all departments, including IT, Legal, Compliance, Risk, IKM, Internal Audit, and Quality.
- The Core Team - The IG team will coordinate all IG-related functions and responsibilities and ensure that all aspects of IG activities, changes, and communications are carried out.
- IG Stewards - individuals from all internal departments who will facilitate the implementation of the IG programme and functions in respective business units.
- Stakeholder relationship - national and international organisations in charge of information management and governance. Ensure that all IG-related standards, legislation, and regulations are aligned nationally and internationally.

4.3 IT infrastructure

The IT department will assist the IG function in successfully implementing IG. IT must ensure that users needing to manage information electronically daily have computers, screens, and networks compatible with the IG's responsibilities. Furthermore, users must be fully trained in computer use before being expected to conduct business electronically. This will be incorporated into the Adoption and Change Management strategy. It is a critical enabler of IG implementation in the digital workplace. IT should supply the most essential IT infrastructure, network, software, and applications. According to Johnston (2010), IG infrastructure is a collection of technologies and systems. Infrastructure includes, but is not limited to, the following:

- Concentrate on controlling information access (identity and access management) and ensuring the security of confidential information and communications.
- It also addresses digital signatures, document encryption, data loss prevention (DLP), leak prevention, and information rights management (IRM).
- It primarily concerns identifying and safeguarding personally identifiable information (PII).
- It entails creating Data Breach Response Plans and responding to breaches.

Achieving this recommended intervention requires executive buy-in, re-assessment of technical strategy, hard and software needs analysis, and a budget commitment. For this reason, IT Infrastructure upgrades to support IG can be done in the medium term.

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4.4 Risk management

Hagmann (2013) states that risk management balances internal/external uncertainties, threats, and potential business opportunities. Because information management and governance are not structured and prevalent with ATNS, IG has a high level of risk. Risk management is not an option for the success of IG implementation in this programme. Risk management will allow for risk mitigation and widen the development of a plan for addressing the identified risks. Risk management is a strategy for dealing with strategic uncertainties, identifying and analysing risks, and implementing appropriate risk management plans to mitigate the potential consequences of the identified risks. Since 'risk management' is a fundamental and urgent need to fortify and secure ATNS information as a strategic asset, management is urged to place it high on the plan and implement it in the short term.

4.5 Change management

To successfully implement IG, a solid change management plan is required. Change management is the fundamental building block in any programme and will be included in all IG activities. Change is unavoidable, and change management is vital in the medium term to ensure that intelligent organisational plans succeed. IG and change management are inextricably linked to altering the structure, guidelines, and rules under which employees operate (Smallwood, 2014).

4.6 IG domains

It is recommended that all of the IG domains and facets listed below be signed for and given formal consent in the short term. They are to be implemented in a stepwise approach over the next five years. They should all be reviewed every 5 to 10 years to update them to conform to changes in legislation, technological advancement, and ATNS strategic goals.

- **Records Management (RM) & Records and Information Management (RIM)**
    - A foundational component of IG.
    - Primarily concerned with identifying, classifying, retaining, using, and eventual disposition of records and information.
- **Content Management**
    - Primarily concerned with the storage and access of electronic records and information.
    - Incorporates security, access controls, retention and disposition, and legal holds for electronic information.
- **Data Management**
    - Alias "Data Integrity" - processes and controls must be in place to ensure data is true, accurate, and unique.
    - It often involves data cleansing (scrubbing) to remove corrupted, inaccurate, or extraneous data and duplication to eliminate redundant data.
    - Often referred to as Master Data Management (MDM), to ensure reports, analyses and conclusions are based on clean, reliable, trusted data typically contained in databases.
- **Long-Term Digital Preservation (LTDP)**
    - LTDP methods, best practices and standards should be applied to preserve an organisation's historical and vital records (those without which it cannot operate or restart operations) and to maintain its corporate or organisational memory.
    - Uploading permanent electronic records into the digital records centre.
    - Digital Preservation is a process, not a technology, that addresses the format, media, software, and hardware obsolesce associated with digital information.

- **Business Intelligence**
    - Primarily concerned with data analytics to identify insights and emerging trends.
    - It can provide solid information for decision-makers to use in times of crisis or opportunities.
    - Has a desire to retain all information to provide better analytics.
    - Implement various strategies, such as employee training in this area, to drive a culture of legislative compliance.
- **Knowledge management**
    - Provides agility of access to organisations' knowledge and information.
    - Improves productivity as knowledge and information are managed, stored, and safeguarded for better and quicker problem-solving.
    - With a well-established knowledge management structure and processes, there will be a culture of openness to sharing knowledge across the organisation and preserving knowledge from loss.

5 Discussions of the findings

IG is crucial for any organisation that is creating data and information. An integrated information governance framework provides an approach that ensures that all aspects of managing information in the organisation are addressed and attended to. The approach should be holistic and comprehensive by considering the legal and compliance framework, alignment of policies and procedures, roles, responsibilities and interests of employees towards information governance, the organisation's infrastructure and risks associated with the management and governance of information.

5.1 Legislative frameworks, policies and standards

Despite the need for stricter controls and to streamline ATNS's IG efforts, there is a better understanding of information governance. A requirement to drive a culture of legislative compliance through the implementation of various strategies, such as employee training in this regard.

5.2 Roles and responsibilities for IG facets within ATNS

The organisation has not defined IG roles and responsibilities. Throughout the organisation, various roles are in charge of IG. The organisation should have defined role(s) and cardinal strategic and operational responsibilities for IG implementation with ATNS. The role of the IG in the organisation is to ensure that the organisation's information assets are managed appropriately to reduce the risk of losing critical information and to ensure that the organisation complies with various laws. Findings in this study have corroborated some of the previously stated facts, which show that it is not uncommon for some state agencies never to find a specific official accountable for access to information. There is a need to form an IG governing committee to oversee IG implementation within the organisation and develop strong IG leadership and executive support for IG implementation.

5.3 IG Infrastructure within ATNS

The organisation's information management and control are unclear. The IT department deploys the infrastructure with no information controls and mostly IG. No specific contextual access to information can be achieved by securely delivering the correct information to the right people at the right time. There is no retention schedule to ensure that information is kept in the organisation according to its value and lifecycle.

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5.4 Employees' Interests in IG within ATNS

The organisation as a whole lacks an information literacy culture. There is no training or awareness of IG, and there are no plans to raise awareness about the value of information as an asset and how it should be managed and governed. Employees do not treat information as a valuable asset that must be safeguarded and managed in accordance with the Records Management Policy and other related policies that have been developed. While there is an understanding of the importance of using information for operational and strategic decision-making, the organisation and its employees have a limited understanding of the value of a comprehensive approach to IG.

5.5 Risks associated with IG within ATNS

As previously stated, the ATNS information governance environment is vulnerable to various risks. As a result, ATNS must include information governance in the organisation's Risk Register. The inclusion of IG on the Risk Register will increase the attention that IG requires, and there will be a need to develop an IG strategy and implementation plan to ensure that organisations' information is managed, secured, and complies with applicable legislation.

5.6 An integrated IG framework for ATNS

While some IG facets are already in place within ATNS, it is essential to centralise the development of IG strategy, functions, and implementation. Collaboratively implementing IG will ensure that information is accurate and secure, that compliance with legislation is addressed, and that fragmented and silo IG initiatives are addressed and coordinated.

6 Conclusion

This study aimed to develop an integrated IG framework for ATNS in South Africa because a solid IG framework is a critical foundation that allows the organisation to govern and manage its information. The results of this research highlighted and illustrated the importance of information governance for organisations, particularly ATNS. Organisations create data and information that should be managed throughout their life cycle. Based on the findings, law and policymakers are persuaded to develop policies that will address the deficiencies organisations face. Government entities have a critical role in ensuring that created information is captured and managed in line with the prescribed laws and policies to ensure compliance. This study uncovered essential areas that need attention for policymakers to consider addressing the alignment of various facets of information governance in the organisation, including managing information as the organisation's asset.

7 Recommendations

The proposed IG framework for ATNS, as compiled by the researcher, can be utilised for further discussion about theory development and application in the field of information science, which is more specific to information governance.

It is recommended that ATNS should intentionally integrate the facets of the Information Governance Framework. The study suggests an Integrated Information Governance Framework that can ensure that the organisation meets legislative requirements and compliance, secures its information assets, makes information easy to access, saves money on storage, and makes insightful and correct decisions based on well-managed information.

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13. Optimising Library Policies as an Ethical Principle for Successful Management of Libraries in Kenya: A Content Analysis

Benjamin Opicho Kemboi

The Technical University of Kenya

benjamin.kemboi@tukenya.ac.ke

Agnes Nduku Katiku

Nairobi City Water and Sewerage Company

katikuagnes2020@gmail.com

Abstract

This study delves into the pivotal role of ethical principles in managing libraries in Kenya, emphasising optimising library policies. Employing a content analysis research design, it scrutinises the ethical dimensions embedded within library policies, evaluates the degree of adherence to established ethical principles and identifies practical barriers that hinder policy optimisation. Findings from the study reveal variations in the alignment of library policies with ethical standards, with public libraries demonstrating a more substantial commitment to ethical principles. Academic and special libraries, however, encounter challenges related to resource allocation, cultural sensitivity, and community engagement. This research underscores the necessity of prioritising ethical considerations in library policy development, emphasising their role in shaping accessible and inclusive library services. The study recommends proactive steps to bolster ethical policy development, improve resource allocation strategies, promote active community engagement, reduce digital divides, and establish standardised policy frameworks to ensure uniform adherence to ethical principles. These recommendations aim to elevate libraries' ethical and effective management in Kenya, strengthening their role as vital hubs for education, culture, and information dissemination. Ultimately, the research seeks to inform policymakers, library administrators, and the academic community, facilitating the enhancement of library services and empowering diverse communities in Kenya.

Keywords: *Library policies, ethical principles, Kenyan libraries*

1 Introduction

The role of libraries as cultural repositories, educational hubs, and information gatekeepers is universally recognised. In an era characterised by rapid technological advancements, libraries worldwide are navigating the challenges of digitalisation, evolving user needs, and the imperative to uphold ethical standards (American Library Association, 2019). Ethical considerations in library management have become a focal point on the global stage, influencing policy development and operational practices.

Africa, specifically Kenya, exemplifies the unique challenges and opportunities libraries face. In Africa, libraries serve as crucial resources for education and cultural preservation. However, they contend with resource constraints, technological divides, and the imperative to be inclusive of diverse linguistic and cultural contexts (World Bank, 2019). With its rich tapestry of cultures and languages, Kenya presents a microcosm of these challenges, reflecting the broader regional landscape.

Various institutions, including public, academic, and special libraries, each catering to distinct community needs, mark the Kenyan library landscape. Local libraries grapple with issues of limited resources, community engagement, and the need for policies that reflect global ethical standards and are tailored to Kenya's unique socio-cultural fabric. This study aims to address these intricacies, providing insights that can inform local practices and contribute to the broader discourse on ethical library management.

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2 Statement of the problem

As vital repositories of knowledge and culture, Libraries in Kenya play a central role in education and community development. However, optimising library policies as an ethical principle for successful management face multifaceted challenges (Sambe et al., 2016; Kibugi et al., 2019; Prakash, 2017). The optimisation of library policies as an ethical principle involves crafting policies that uphold ethical standards such as intellectual freedom, equitable access, and privacy protection (Davis, 2017). It requires aligning policies with ethical values and actively implementing them to ensure adherence in practice (Knuth, 2018). By prioritising ethical considerations in policy development and management, libraries promote fairness, transparency, and respect for diversity (Bertot et al., 2014). This approach fosters trust, integrity, and accountability within the library community, supporting libraries to serve as inclusive, accessible, and socially responsible institutions (Jaeger et al., 2012). Despite the global emphasis on ethical standards in library management, there is a shortage of comprehensive studies exploring the practical application of these principles within the unique socio-cultural context of Kenya. This study seeks to address this gap by investigating the ethical dimensions of existing library policies. The challenge lies in understanding the variations in adherence to ethical principles across different library types, including public, academic, and unique and diverse regions of Kenya.

Resource constraints, technological disparities, and cultural diversity further complicate the optimisation of policies (Jones et al., 2018; Whitelaw et al., 2017). The gap between policy formulation and practical implementation poses a significant challenge, impacting inclusivity, equitable access, and community engagement. This research aims to uncover the intricacies of ethical library management, identifying practical barriers that hinder policy optimisation. By delving into the nuanced challenges faced by libraries in Kenya, this study seeks to provide insights that can inform policy decisions, enhance library services, and contribute to the broader discourse on ethical information management in a globalised yet culturally diverse context.

The study aims to systematically analyse the ethical dimensions of library policies in Kenya, addressing variations in adherence across library types and regions. Its objectives are to assess these dimensions, evaluate adherence to ethical principles, and identify practical barriers to successful library management. The significance of the study lies in its potential to enhance library management by informing policy decisions, improving services, and guiding ethical practices. By considering diverse library types and regions, the study acknowledges unique challenges. It aims to foster more inclusive and accessible library services, ultimately elevating ethical standards and positively impacting libraries' roles as cultural and educational cornerstones in Kenya.

3 Literature review

The objectives of this study are to assess the ethical dimensions, evaluate adherence to ethical principles, and identify practical barriers to optimising library policies in Kenya. Ethical considerations in library management are paramount for ensuring equitable access to information, protecting user privacy, and promoting cultural sensitivity.

Research by Davis (2017) emphasises the importance of ethical principles in guiding library practices, such as intellectual freedom and the rule of law. Similarly, Knuth (2018) discusses the significance of intellectual freedom and highlights the role of libraries in upholding ethical standards.

Assessing the ethical dimensions of library policies involves examining the extent to which policies align with established ethical principles. Studies by Bertot, Real, and Lee (2014) and Jaeger et al. (2012) discuss the intersection of public policy and access to information, highlighting the ethical implications of digital inclusion and digital literacy in libraries.

Evaluating adherence to ethical principles requires assessing the practical implementation of policies. Hauptman (2013) discusses ethical issues in library and information science, emphasising the importance of translating ethical principles into actionable practices.

Identifying practical barriers in policy optimisation involves understanding libraries' challenges in implementing ethical principles. Research by Abdulwahab and Ghazali (2013) explores cultural sensitivity in library website development, shedding light on the challenges libraries encounter in catering to diverse cultural contexts.

4 Theories of the study

The following are the theories of the study: Institutional theory and diffusion of innovation theory. Discussions are as follows.

4.1 Institutional Theory

Institutional theory provides a lens to understand how organisations, in this case, libraries, are influenced by external pressures and internal norms (Meyer & Rowan, 1977). The study can apply institutional theory to explore how libraries in Kenya conform to or deviate from global and regional ethical standards. According to DiMaggio and Powell (1983) and Scott (2014), this theory considers the isomorphic pressures that shape organisational behaviour, including coercive pressures from regulations, normative pressures from professional standards, and mimetic pressures from the practices of other libraries. By employing institutional theory, the study can investigate the institutional forces influencing the development and implementation of library policies, shedding light on the external and internal factors that drive or hinder the optimisation of policies in alignment with ethical principles.

4.2 Diffusion of Innovations Theory

The diffusion of Innovation theory can be relevant to understanding how ethical principles diffuse and are adopted within the library landscape in Kenya (Rogers, 2003). This theory posits that adopting new practices, in this case, ethical principles in library policies, follows a pattern of innovation diffusion through different stages (Valente, 1995). The study can explore the diffusion process's awareness, interest, trial, adoption, and institutionalisation phases. It can assess how libraries in Kenya adopt ethical innovations, considering factors such as the relative advantage of ethical policies, compatibility with existing practices, complexity, observability, and trialability (Ryan & Gross, 1943). Applying this theory helps to identify factors influencing the successful integration of ethical principles into library policies. It offers insights into strategies for promoting widespread adoption across Kenya's diverse library types and regions.

5 Methodology of the study

The study adopts a content analysis research approach to systematically examine library policies in Kenya. This design allows for the structured investigation of ethical dimensions, adherence to principles, and identification of practical barriers. Data collection involves gathering policy documents from diverse library types and regions (Neuendorf, 2017). Content analysis facilitates the quantitative coding and qualitative interpretation of policy content. This methodological choice is justified as it enables a comprehensive exploration of ethical practices, capturing both quantitative trends and qualitative insights. The content analysis offers a systematic and replicable framework for analysing large volumes of textual data, ensuring rigour and reliability in the study's findings.

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6 Results

6.1 The ethical dimensions

The study by Nyamboga (2013) reveals the variations in the emphasis placed on different ethical dimensions across library types and regions in Kenya. He argues that public libraries might strongly focus on intellectual freedom and equitable access principles. In contrast, academic and special libraries may prioritise different ethical considerations.

Findings from a study by Wamuyu and Mureithi (2012) indicate the extent to which Kenyan libraries align with global ethical standards. The study continues to reveal the degree of incorporation of international ethical guidelines, such as those from the American Library Association or the International Federation of Library Associations and Institutions, into local library policies (American Library Association. (2019; IFLA, 2012).

The study by Brey (2007) reveals gaps in the library's ethical framework. Such gaps affect libraries in Kenya, which fail to address ethical considerations. This includes gaps in privacy protection, challenges related to cultural sensitivity and disparities in promoting intellectual freedom. Brey's (2007) findings also highlight areas for improvement in ethical policy development and implementation.

6.2 Adherence to ethical principles

A study by Knuth (2018) revealed variations in the levels of adherence to ethical principles among different types of libraries, which may apply to Kenyan libraries. The study also shows that public libraries, for instance, might exhibit a higher adherence than academic or special libraries. In addition, he argues that understanding these variations can inform targeted interventions to enhance ethical practices across diverse library contexts.

Davis (2017), in his findings, highlights inconsistencies between the articulation of ethical principles in library policies and their practical implementation. He continues to say that this could include discrepancies in the protection of user privacy, accessibility for diverse user groups, or the handling of sensitive information, shedding light on areas that require attention to bridge the gap between policy intent and implementation.

Hauptman's (2013) study uncovers regional disparities in adherence to ethical principles, reflecting the unique socio-cultural contexts in most information centres despite being in different parts of the country, especially the developing world like Kenya. For instance, he contends that libraries in urban and rural settings may demonstrate varying levels of commitment to ethical standards. Hauptman (2013) recognises these disparities as crucial for tailoring strategies that address the specific needs of libraries in diverse regions.

6.3 The practical barriers

Studies done by Bertot et al. (2014) and Jaeger et al. (2012) reveal that resource constraints, such as limited funding and staffing, act as substantial barriers to the effective implementation of ethical principles in library policies. They continue to say that public and academic libraries, in particular, might face challenges in allocating resources to meet ethical standards, impacting services and access.

The findings of a study by Durrance and Fisher (2003) suggest that digital divides, including disparities in technology access and digital literacy, hinder the optimisation of library policies. They continue to say that these could impact the equitable provision of digital resources, access to online information, and the ability of libraries to engage with diverse user groups, especially in regions with limited technological infrastructure.

Kling's (2000) study identifies practical barriers to cultural sensitivity in policy development and implementation. Abdulwahab and Ghazali (2013) also say that libraries might encounter challenges in tailoring policies to diverse cultural contexts, leading to gaps in understanding and meeting the unique needs of their communities.

7 Conclusion

In conclusion, the findings of this study illuminate crucial aspects of the ethical dimensions and practical challenges surrounding the optimisation of library policies in Kenya. The variability in adherence to ethical principles across different library types and regions underscores the need for nuanced policy development and implementation approaches. Discrepancies between the articulation of ethical principles and their practical manifestation highlight potential areas for refinement in policy execution. Moreover, the identified practical barriers, including resource constraints, digital divides, and challenges in cultural sensitivity, shed light on the complex landscape libraries navigate in their pursuit of ethical management.

Understanding the intricate dynamics of library policies and their ethical implications is foundational for fostering inclusive and effective library services. The insights gained from this study contribute to the broader discourse on ethical information management, providing a context-specific understanding of the challenges libraries face in Kenya. These findings serve as a critical foundation for future research and policy adjustments, offering a comprehensive perspective on the current state of ethical library management within the unique socio-cultural landscape of Kenya.

8 Recommendations

Based on the findings of this study, several recommendations emerge to enhance the ethical management of libraries in Kenya.

- Targeted interventions are needed to address variability in adherence to ethical principles across library types.
- Tailored training programs, workshops, and guidelines suggested to standardise ethical practices.
- Ongoing assessment and refinement of policies are recommended to align with global standards.
- Priority on addressing resource constraints through increased funding, staffing, and technological support.
- Strategies like community outreach programs and digital literacy initiatives are proposed to overcome digital divides.
- Cultural sensitivity training for library professionals advocated for inclusive policy development.
- Recommendations aim to strengthen the ethical fabric of library management in Kenya.
- Aim for a more uniform, accessible, and culturally sensitive approach across all library types.
- Implementation of recommendations can contribute to the evolution of libraries as ethical, inclusive, and effective institutions within the Kenyan socio-cultural landscape.

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14. Futuristic View of Robotics in Enhancing Library Accessibility for Differently-Abled Users in Kenya and South Africa

Villary Atieno Abok*; Daniel Rankadi Mosako**

*Technical University of Kenya
atienovillary@gmail.com

**University of South Africa
mosakdr@unisa.ac.za

Abstract

In the current millennium, the development of technologies for people differently abled in information services institutions has become the focus of concern. As a result, South African libraries and those in other developing nations, such as Kenya, aspire to adjust to the digital era and improve accessibility and inclusivity for all people, including those with disabilities. The latter are faced with obstacles towards attaining equitable access to information and library inclusiveness to advance their education. This paper uses a systematic literature review and non-obtrusive observation as a data collection tool under qualitative research to argue the importance of integrating robotic systems in libraries to bridge the accessibility gap. Through this data collection approach, the study's objectives of evaluating the impact of futuristic technologies to transform the library experience for differently-abled library users are engaged. Such an innovative transformation is necessary because robots are envisioned to perform various enabling tasks, such as retrieving books from shelves, collating digitally retrieved information for clients, and handling real-time language translation services. Furthermore, robotic technologies facilitate remote library access, allowing end-users to request, receive, and retrieve information remotely for individuals with visual or auditory impairments. This study contributes to the information and library services field by filling the accessibility gaps by outlining guidelines to address the implementation of robotics in South African and Kenyan libraries. The focus is developing guidelines to enhance inclusivity and accessibility for differently-abled users, expanding existing knowledge in this area.

Keywords: *Digital technologies, inclusiveness, library enhancement, library use barriers*

1 Introduction

Rapid advancements in digital technology in the 21st century have compelled institutions, including libraries, to evaluate their technological capabilities and embrace the opportunities presented by ever-evolving technology and its digital revolution (Ikenwe & Udem, 2022). Consequently, libraries must join the technological trend to enhance the experience for all clients, including individuals with disabilities. The role of libraries in ensuring inclusivity and accessibility for all members of society is increasingly gaining significant exposure (Copeland & Woolls, 2023).

Therefore, integrating robotics and artificial intelligence in libraries offers a promising opportunity to create a more inclusive and accessible environment for all users, particularly those who are differently-abled. By automating the retrieval and management of physical materials, robotic systems can mitigate the limitations of traditional library spaces and empower individuals with disabilities to independently access a broader range of resources, including those with dementia (Yang et al., 2021). Furthermore, Tella and Ogbonna (2023) express that using telepresence robots can enhance accessibility for users with disabilities by providing virtual sign language interpretation services and enabling remote access to library services and resources. It is based on these academic suggestions that this research aims to explore the potential of robotics in improving library accessibility for individuals who are differently-abled in developing countries

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by investigating the benefit of incorporating robotic systems in libraries and their contribution to the development of more inclusive and equitable library spaces.

Arguably, robotics in libraries in developing countries can significantly improve accessibility for individuals with disabilities, and ongoing research and development in this area are focused on creating more equity-oriented educational experiences and equitable library spaces (Worsley & Bar-El, 2022). This line of argument is further presented by Kasuk and Virkus (2024), who states that the integration of robotic systems, including telepresence robots, holds promise for enhancing the overall library experience for users with disabilities, as they present innovative solutions for the future that contributes to a more accessible and inclusive society.

Integrating robotics and artificial intelligence in libraries offers various advantages, including enhanced efficiency, accuracy, and user experience in cataloguing, management, and operations tasks. Connaway and Radford (2021) add that such integration can yield exponential results if combined with artificial intelligence (AI) that supports reference services, information retrieval, and collection management, speeding up the process of finding information and making recommendations for relevant resources. Such a combination strengthens robotic systems to overcome the limitations of traditional library spaces. It enables individuals with disabilities to access a broader range of resources as they blend virtual elements with the real world (Panda & Kaur, 2023). These technologies have been applied to shelving, locating library materials, security, and answering repetitive queries. Overall, such a combination can improve the library experience for all users, enhance accessibility for individuals with disabilities, and contribute to a more inclusive society.

2 Problem statement

Libraries play a crucial role in providing access to information and knowledge. However, differently-abled individuals often face exclusions in accessing library resources. Additionally, most traditional and some modern libraries are not advanced enough to cater to the information needs of the differently abled in the present millennium. Therefore, this study outlines guidelines for futuristic solutions, such as adopting and implementing robotics, to enhance library accessibility for differently-abled users. By converting these exclusions into inclusive library and information services practices, an equitable learning environment can be created in academic Library space, ensuring that accessibility to information and educational knowledge is created for everyone, regardless of their abilities.

3 Objective

The study's objective is to examine the obstacles that differently-abled individuals currently encounter while attempting to access resources in academic institution libraries. Additionally, the study investigates the possibility of utilising robotics to enhance library accessibility for differently-abled users. By evaluating how futuristic technologies affect the general library user experience at academic institutions and offering recommendations for using cutting-edge robotics digital technology in libraries to improve accessibility for patrons.

4 Methodology

To achieve the outlined objectives, this study followed a qualitative research approach, using a systematic literature review on the following subject areas that focus on tools for library inclusiveness because these are attuned to the research topic. These were limited to the use of robotics in libraries for the impaired users, accessibility of information for the impaired users, and emerging technologies for visually impaired users in libraries. The theoretical framework used to frame this study is System Integration Theory (SIT), which is based on the unification of people and the uniform functioning of sub-systems. For this study, the SIT is applied to integrate heterogeneous concepts such as data sources with different robotic technologies applications. These aimed to ease accessibility to resources in library facilities for differently-

abled people. The success of the application of SIT resulted in a homogeneous understanding of how robotic technology can be applied to benefit the end integration outputs that will benefit the end-user and present the functional integration guidelines.

The SIT is used in this study to integrate heterogeneous concepts, such as various data sources and robotic technology applications, which are designed to make it easier for those who are differently abled to access resources in library facilities. Due to the successful implementation of robotic integration into library functions in first-world countries, there is a common understanding of how robotic technology may present functional integration, enhancing end-user outcomes.

The second theory that underpins this study is the human-machine collaboration theory, which is conjoined to the SIT in this study to look at the collaboration and functionality of human beings around automated machines. The integration is done to recognise and break down silos between human resources and technology and further identify new strategies for improving human-machine teams. This study considers this joint approach and strategy to encourage the success of human and machine collaborations to complement human talent beyond human ability by applying overdrive through robotic devices to advance service output. The focus of this study's methodology and its theoretical framework is centred on the context of the 4th Industrial Revolution, with examples demonstrating how robotic technologies can foster library accessibility, with a particular emphasis on differently-abled individuals. The choice of systematic literature review assists in collating related publications that fit the criteria to address the research questions.

5 Systematic literature review

Integrating robotics and artificial intelligence in libraries presents a promising opportunity to create a more inclusive and accessible environment for all users, particularly those with disabilities. This review examined the potential of robotics in improving library accessibility for differently-abled individuals. Data drawn from this review focused on challenges, mitigation, and solutions to the barriers experienced by differently-abled individuals at library institutions.

The search strategy involved using keywords, which formed the main concepts of this study. These were robotics (robot*), library, information service, differently abled, visual impairment (visual impairment*), deaf, hard of hearing, physically disabled (physically disabled*), users, Kenya, and South Africa.

Various databases (EBSCO, Emerald, ProQuest, and Google Scholar) were searched from December 2023 to January 2024. These databases provided relevant references for this study. The retrieved publications were adopted for the study only if they were relevant to the study objectives; otherwise, they were eliminated. Only publications in the English language were included. Additionally, books were excluded since much of the information they tend to contain is relatively outdated.

The selected literature was further screened, and data extracted using Covidence software was then synthesised using Microsoft Excel to unveil the necessary details that informed this study.

5.1 Obstacles at library institutions

The literature review revealed that differently-abled individuals face several challenges in accessing library resources, including physical barriers such as high shelves, limited assistance from staff and even limited designated parking spaces (Dhara, 2015). Moreover, Idiodi and Urhiewhu (2023) affirm that traditional library spaces are not fully equipped to cater to the diverse needs of differently-abled users, such as those with visual or hearing impairments.

Communication barriers hinder effective interaction between library staff and differently-abled individuals (Ayoung et al., 2021). The lack of provisions for sign language interpreters or alternative communication

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methods impacts users' experience, such as those with hearing impairments. Furthermore, the absence of specialised technology and assistive devices, like screen readers or magnification software, that cater to the specific needs of users with disabilities further challenges accessibility to library services (Idiodi & Urhiewhu, 2023).

Additional obstacles arise from inaccessible formats, such as information materials lacking a braille version and web pages without audio features, which pose accessibility difficulties for individuals with visual and hearing impairments, respectively (Beyene et al., 2023). Such obstacles and limitations of library services, coupled with the absence of well-trained staff to serve this user segment, stand out as a significant challenge faced by libraries in developing countries (Onsinyo, 2018).

5.2 Utilising and solutions of robotics integration

Ideal inclusive library environments are being enjoyed and experienced in first-world countries, and such experiences are due to be levelled in developing countries by incorporating the benefits of robots and AI in libraries. This futuristic solution aims to overcome physical barriers and limitations in traditional library spaces by enhancing accessibility for all users. On this basis, Joiner (2018) argues that there is great potential that comes with the incorporation of robotics for modern society because they help mitigate and address challenges at library institutions and create more inclusive library environments.

Credible research data reveals that libraries that have successfully incorporated robotic systems are on the futuristic path of success in improving accessibility for differently-abled users (Bansal et al., 2024). Such is an excellent path because robotic systems can automate the retrieval and management of physical materials, thereby reducing the physical barriers to access through systems such as telepresence robots.

5.3 Advancing user experience and accessibility in libraries

Including the end-user experience in the reviewed literature informed the assessment of the impact of futuristic technologies on the overall user experience in libraries, including the perspectives of both users and library staff. This evidence is based on the case study conducted by Pujari and Deosarkar on libraries that have implemented robotic systems. In their study, the sampled libraries with robotic systems demonstrated the potential brought by incorporating robotics to enhance the overall user experience. Such incorporation linked library resources to information seekers through robots (Pujari & Deosarkar, 2017). Based on this case study, one can deduce that such a benefit also includes enhanced user experience for differently-abled individuals.

The literature provides evidence for the benefits of integrating robotics and other advanced technologies in libraries that enhance accessibility for all users. Furthermore, it delineates the methods by which library institutions foster the integration of robotics in enhancing library services. These approaches comprise the library professionals involved in designing robotic solutions adaptable to various physical environments and end-user needs so that the designed devices can adapt to a broad range of needs for different disabilities (Fiorini et al., 2021). It is equally essential for libraries to prioritise investing in customised staff training and support to ensure the seamless integration of robotics into library operations as a complement for customer service delivery and not as a threat to their jobs as perceived by robot operations in libraries (Phillips, 2017).

Munyoro et al. (2023) also intensify the argument for staff cooperation by adding that collaboration between library professionals, technology experts, and differently-abled users must be fostered to advocate for best practices while considering the ethical matters and inclusive strategies for the cordial use of robotics in library settings. On this note, Watts et al. (2023) add that staff components must understand the customised needs of differently-abled information seekers. Therefore, facilitating the experience of differently-abled library services in the current millennium is essential logic.

It is worth noting that the lead authors of the subject on robotics in enhancing accessibility in libraries, Tella and Ogbonna, are encouraging library institutions in developing countries to explore the use of telepresence robots in their libraries. They point out that this option is beneficial as it allows end-users to interact remotely with the libraries through a camera and/or a screen (Tella & Ogbonna, 2023).

Overall, the review highlights the potential benefits of robotics in enhancing library accessibility for differently-abled users. By addressing the specific challenges faced by this user group of individuals, futuristic technologies can contribute to creating more inclusive and equitable library spaces. However, it is essential to ensure that these technologies are implemented in a manner that is user-centred and sensitive to the diverse needs of both the mainstream and the differently-abled communities (Moon et al., 2019). Furthermore, cost, maintenance, and staff training considerations must be carefully evaluated to maximise the long-term benefits of such investments (Javaid et al., 2021).

The reviewed literature provides valuable insights into the use of robotics incorporated with AI in libraries, highlighting the potential for these technologies to transform the accessibility and user experience in library settings for end-users, particularly the differently abled. The articles and research papers presented real-world examples, expert opinions, and prospects, which informed the development of this systematic literature review.

6 Non-obtrusive observation notes

Robots are designed to perform various enabling tasks, including retrieving digitally obtained information for clients and organising books from shelves. They can also manage real-time language translation services and answer clients' inquiries, offering 24-hour support. "Lwazi," a robot integrated by the University of South Africa as an Academic Development Open Virtual Hub (ADOVH) enhancer, illustrates a robotic service. It can handle information requests from patrons who are non-disabled and differently-abled based on data fed in by trained staff members, a humanoid robot. Unisa uses this technology to present itself as a digital environment that fosters timely service delivery, particularly when answering customer inquiries.

Kenyan academic libraries have not yet integrated robots into their service provision. However, their future experience will likely mirror that of South Africa. This observed state sheds light on future developments in Kenya's academic library space for differently library-abled users.

7 Findings and Discussion

The examination of literature and the non-obtrusive observation revealed that specific academic libraries have effectively utilised robotic systems to address service delivery, thereby reducing the obstacles that hinder accessing library services. Expressed, the reviewed literature revealed that libraries are using robotic technology and are headed toward a bright future in increasing accessibility for their patrons, including differently-abled users. Notes from non-obtrusive observations illustrate that incorporating robotics in academic institutions can enhance the overall user experience by resolving patrons' queries around the clock 24/7. The additional findings from the systematic literature review further support the potential benefits of robotics in enhancing library accessibility for differently-abled users. Thus expressing the benefits of combined human and machine integration beyond routine working hours.

Additionally, the surveyed literature highlighted telepresence robots as a popular method to improve accessibility for differently abled users, as such technology provides alternative means to access library services and resources remotely. Furthermore, integrating robotics and AI in libraries was expressed as an innovative means to extend library services beyond the traditional limitations of brick-and-mortar.

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Moreover, the reviewed literature showcased the increasing adoption of telepresence robots in various fields to enable remote presence, indicating the growing applications of this technology in enhancing accessibility, including physical accessibility. This discussion collectively reinforces the potential of robotics and telepresence technologies in creating more inclusive and equitable library spaces for end users. The University of South Africa, based on observations, endorses futuristic technologies such as the ADOVH humanoid robot to fill up the service delivery gaps that are beyond human capabilities. Notably, these services are compatible with international library culture, offering help to patrons through collaborative integration to library personnel, which makes the presence of library staff non-redundant. (Vlachos et al., (2020).

Bashir et al. (2017) emphasise the importance of libraries as service-oriented institutions that support all patrons, including those with special needs, without prejudice. This perspective encourages the adoption of robotics in libraries to create a more inclusive and accessible environment for all users, including those with disabilities. By automating the retrieval and management of physical materials, robotic systems can alleviate the constraints of traditional library spaces and enable differently-abled individuals to access a broader range of resources independently. However, it is crucial to implement these technologies in a user-centred manner and consider the diverse needs of users. Additionally, cost implications, maintenance, technological obsolescence, and staff training must be carefully evaluated to maximise the long-term benefits of such investments.

To ensure the accessibility of their physical spaces for differently-abled individuals, libraries should implement various measures. The library environment, including the entrance, should be made accessible for persons with different kinds of disabilities, such as wheelchair users and those who are visually impaired. This involves wheelchair accessibility, comprehensive and clear aisles, and removing protruding objects. Furthermore, libraries should consider reasonable structural modifications, including automatic doors, handrails, elevators, ramps, and clear travel paths and providing accessible tables, desks, restrooms, and parking. By incorporating these measures, libraries can create welcoming, accessible, and usable physical spaces for all individuals, regardless of their abilities.

Some of the most promising robotics applications in libraries to enhance accessibility for differently-abled users include telepresence robots to provide virtual sign language interpretation services, enabling remote access to library services and resources, and enhancing overall accessibility for patrons with disabilities. Additionally, robotics and other technologies can be used to develop devices that assist people with deafness or blindness, such as robotic hands designed to speak sign language and devices that translate text into braille or speech. Moreover, telepresence robots can be designed specifically for accessibility, incorporating features such as audio text, touch screens, and other assistive technologies to serve differently-abled patrons better. These applications demonstrate the potential of robotics to create more inclusive and accessible library environments for individuals with disabilities.

8 Conclusion

In conclusion, integrating robotics in libraries is highly recommended to enhance accessibility for differently-abled users, as it can address the specific challenges faced by this user group and create more inclusive and equitable library spaces. Successfully implementing robotics in libraries requires a comprehensive understanding of user needs, thoughtful planning, and ongoing evaluation. This study paves the way for further exploration and implementation of robotic systems in libraries, focusing on improving accessibility for all end users. The findings from the literature review, including the successful implementation of robotic systems in libraries, the potential of telepresence robots to enhance accessibility, and the benefits of assistive robotics for users with disabilities, collectively emphasise the transformative potential of robotics in creating more inclusive and accessible library environments.

The literature highlights several challenges libraries face in implementing robotics to enhance accessibility for differently-abled users. One of the main challenges is the need for careful planning and evaluation to ensure that the technology is user-centred and sensitive to the community's diverse needs. Additionally, the compatibility of telepresence robots with existing library systems and devices can be challenging, limiting their accessibility for some patrons. Furthermore, customising assistive robotics is crucial to ensure efficacy and establish trust between the user and the assistive device.

The reviewed literature also emphasises the importance of involving people with disabilities in the early stages of robotics design to ensure inclusivity and address their specific needs. Finally, the successful integration of robotics in libraries requires staff training and support to ensure the seamless integration of robotics into library operations and assist users as needed. These findings collectively highlight the importance of careful planning, evaluation, and user involvement in successfully implementing robotics to enhance accessibility for differently-abled library users.

9 Recommendations

Based on the discussion, the following guidelines are recommended to mitigate the challenges differently-abled individuals face as information seekers in library spaces.

9.1 Resolving access to library resources

Access to library resources should involve exploring the potential of robotics to improve library accessibility for differently-abled users. Thus, the impact of futuristic technologies on the overall end-user experience in libraries should be assessed, and guidelines for integrating emerging robotics and digital technology in libraries should be provided, enhancing accessibility for all users.

9.2 Provision of better service for differently-abled patrons

It will benefit the library to prioritise expanding the end-user experience, particularly for differently-abled patrons. To accomplish this intent, library staff members should be trained to understand various disabilities and assist patrons with different needs. They should also be equipped with digital screen sign language knowledge and be aware of the library's physical accessibility. This is why assistive technologies such as large-print materials and sign language interpreters should be provided for visual or hearing impairments. A designated staff member or committee should be allocated in the library to coordinate services for people with disabilities and monitor adaptive technology developments. Written descriptions of services for patrons with disabilities should be developed and advertised. Furthermore, various media formats, including audio descriptions, braille labels, and alternative formats, should be offered to make library resources more accessible. In addition, library staff should be diverse and inclusive, including people with disabilities, to better understand and serve the needs of diverse patrons. Collaboration between library professionals, technology experts, and disability advocates should be fostered to develop best practices and guidelines for the ethical and inclusive use of technology in library settings.

9.3 Ideal types of robotics to be embraced by libraries to enhance accessibility for differently-abled users

On the other hand, it will be advantageous for libraries to conduct ongoing research to enhance accessibility for differently-abled users by embracing prioritised robots that offer virtual sign language interpretation services and facilitate remote access to library resources. Telepresence robots, equipped with features like voice recognition and touch screens, cater to patrons with mobility impairments. Robots designed to interact with users by locating books, answering questions, and guiding them to resources can be beneficial. Social robots can assist patrons with social anxiety by providing a more approachable interaction. The implementation of chatbots can also help users search for books, send reminders, and direct them to

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relevant resources on the library's website. These robots, integrated with AI, can manage library spaces effectively and improve accessibility for differently-abled users.

9.4 Resolution of challenges that libraries have faced in implementing social robots to enhance accessibility for differently-abled users

Libraries must ensure equal service for all users, considering physical limitations, different languages, and impaired vision when implementing social robots. Furthermore, staff should be trained in troubleshooting to prepare staff for potential robot malfunctions and rude behaviour by customers, which is necessary to protect librarians.

Adopting the recommended guidelines can help academic libraries fulfil end users' information and knowledge needs, particularly those with disabilities.

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15. Copyright Practices in Academic Libraries: Insights from the Aga Khan University

Esther Wanyingi*; Arnold Mwanzu**; Peter Gatiti***

Aga Khan University

*esther.muthoni@aku.edu; **arnold.mwanzu@aku.edu; ***peter.gatiti@aku.edu

Abstract

This paper examines the importance of copyright practices in academic libraries. It discusses the copyright services provided the world over, giving insights from the Aga Khan University libraries, which are also considered pioneers in such services in Eastern, Central Africa, and Eastern Asia. The paper explores the types of copyright services offered by academic libraries, how faculty, students, and staff use these services, and the challenges libraries face in providing copyright services. The paper uses a desk review to identify institutions that have established copyright services in Academic libraries while highlighting best practices for developing and delivering copyright services. Some practices include providing clear and concise copyright information, copyright clearance for teaching material and institutional repository archival scholarly outputs, offering workshops and consultations, and collaborating with faculty to integrate copyright education into the curriculum. A key component of copyright services is educating users about fair use. By implementing these best practices, academic libraries can ensure their users know their rights and responsibilities under copyright law. With highlights of some of the academic libraries that have established copyright offices, the paper points out the difficulties encountered in conforming to copyright restrictions while fulfilling library objectives of providing access to knowledge. This paper guides by giving insights from AKU Library's copyright policies, strategies, and initiatives and examining the existing literature on copyright services in academic libraries. It proposes effective strategies for libraries to support the information needs of their users within the legal framework of copyright law. It also provides recommendations on how university libraries may establish copyright services.

Keywords: *Copyright, fair use, academic integrity, institutional repository, copyright services*

1 Introduction

According to Klein et al. (2015, p. 1), copyright is a legal concept in Intellectual Property that gives creators of original works exclusive rights to their work, allowing them to choose how it is used and distributed (p. 1). Charbonneau and Priehs (2014, pp. 228-233) state that copyright is a complex legal issue that affects many aspects of modern life, including academic libraries. Academic libraries provide researchers, faculty members, students, and the wider academic community access to and disseminate knowledge and information. Ferullo and Buttler (2023) state that academic libraries manage copyrighted works, grant users access to resources and guide users on how to use copyrighted material.

Halder and Mridha (2016, pp. 55–67) note that the role of copyright in academic libraries is complex and evolving, requiring ongoing education and understanding of copyright. (Prilliman, 2008) notes that fair use presents challenges and ambiguities, especially in digitisation and electronic dissemination of materials. Smith and Davis (2013, pp. 57-66) noted that to navigate these complexities, best practices have been proposed, including the need for a more nuanced understanding of fair use and the development of new promotion and tenure procedures for digital scholarship. According to (McCormick, 2014, p. 5), managing copyright regulations and guaranteeing adherence to intellectual property rights has grown more difficult in the digital era due to the simplicity of digital content dissemination, manipulation, and replication.

This paper explores the copyright practices employed by academic libraries, focusing on their strategies for managing copyrighted materials, providing access to resources, and supporting users while adhering to legal requirements. It also examines the role of copyright law in academic libraries and the strategies these institutions can use to manage copyright, including policy development and user education to ensure compliance and high-quality services in academics.

2 Methodology

This study employed a desk review approach to examine copyright services in academic libraries. Peer-reviewed journal articles published within the past twenty years were retrieved from academic databases such as Google Scholar, JSTOR, and EBSCO Host. The search terms used included "Copyright services," "Copyright Compliance," "Fair Use," "University library copyright services," "Fair use guide for students" and "Academic Libraries." Articles were included if they provided insights on copyright support services in academic libraries. Articles focusing on copyright in non-library settings were excluded. Thematic analysis was applied to identify recurring themes and synthesise the findings on the copyright services in academic libraries. Additionally, a comprehensive search of research reports, policy documents, strategy papers, web pages, corporate documents, academic databases, Google Scholar, and websites was done to identify libraries with copyright support services. Further, the paper provides insights from AKU libraries on how the copyright office was established, standard operating procedures, the services provided, and the challenges encountered.

3 Copyright services in libraries

According to (Urs, 2004, p. 203), copyright law significantly impacts academic libraries, shaping how faculty, students, and staff access and utilise information resources. Libraries play a crucial role in supporting scholarship and research, but copyright complexities can pose challenges. To address these challenges, academic libraries offer a range of copyright services. This literature review explores the current landscape of copyright services in academic libraries.

(Urs, 2004) further states that the various services offered by libraries include providing easily accessible resources such as library guides frequently asked questions, or copyright cheat sheets which empower users with basic copyright knowledge; Training workshops and sessions educating users on fair use, permissions, and copyright best practices; Copyright consultations to address specific copyright questions users may have regarding their research or teaching activities; Copyright policy development in collaboration with campus administration to guide the responsible use of copyrighted materials.

(Lakhan & Khurana, 2008, p. 7) note that copyright law confers exclusive rights on authors and owners of original works, such as literary, artistic, and scholarly resources. It serves as the legal framework governing the usage and dissemination of intellectual property, ensuring that creators and owners of original works are granted exclusive rights over their creations. According to (Fernández-Molina et al., 2017, pp. 242- 243), in the context of academic libraries, adherence to copyright regulations is critical for maintaining legal compliance while supporting their essential objective of giving access to information and knowledge. The multifaceted network of rights granted by copyright law includes critical issues such as reproduction, distribution, public exhibition, and the development of derivative works. Each of these rights substantially impacts how academic libraries organise and manage the materials they hold and the services they provide to their users.

Fernández-Molina et al. (2017, p. 243) further note that academic libraries, as caretakers of vast collections of knowledge, must manage copyright works carefully to ensure compliance while achieving their goal of allowing access to information. (Crews, 2020, p. 9) further notes that understanding and applying copyright law rights is critical to academic library copyright management processes. The right of reproduction, for example, governs how libraries handle the duplication of copyrighted items, whether by photocopying, scanning, or digitisation.

(IFLA, 2002), notes that the freedom to distribute determines how libraries make copyrighted works available to their patrons, whether through physical loans or technological delivery channels. Furthermore, the right to public exhibition governs how libraries present copyrighted materials, such as through exhibitions or public displays. In contrast, creating derivative works entails transforming or adapting original works, which can occur through translation or annotation. These rights put libraries at the forefront of copyright issues, hence the need to ensure absolute compliance. According to (Mower, 2020),

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the successful management of copyrighted resources in academic libraries is diverse, comprising a variety of strategies and procedures aimed at ensuring copyright compliance while serving users' educational demands. This includes developing and implementing copyright policies and procedures customised to the library's specific environment and mission.

4 Copyright fair use/fair dealing exemption

According to (Pressman, 2008, pp. 89-110), academic libraries frequently depend on copyright law exemptions, such as fair use, to allow for some uses of copyrighted content without the copyright holder's explicit consent. Fair use issues are critical in educational contexts, where the use of copyrighted works for teaching, research, and scholarship is frequently allowed under specific conditions. Understanding fair use can be challenging because it is subjective and requires careful evaluation of various factors. Libraries can navigate the complex terrain of fair use by carefully evaluating the four factors discussed here.

Crews (1993, p. 45) notes that the first factor is the purpose and character of the use in which libraries examine the aim and character of usage by determining whether the use of copyrighted work is transformative or non-transformative. Criticism, commentary, news reporting, teaching, study, and research are all examples of transformative uses that are likely to be declared fair use. Non-transformative uses, such as commercial exploitation for profit, may undermine a fair use determination. Awad (2022, pp. 9-56) notes that the second factor is the nature of the copyrighted work, which evaluates whether it is factual or creative to determine its nature. Published works and extensively distributed works, especially factual works, are more likely to fall under the purview of fair use. Although creative works like books, movies, and artistic creations may have stronger copyright protection, fair use is still permitted in some situations.

Depoorter and Parisi (2002, pp. 454–473) note that the third factor is the amount and significance of the portion used, which examines the portion of the work used with respect to the entire copyrighted work. While there are no hard quantitative limits, using a lesser portion of the work, such as extracts or snippets, is more likely to be declared fair use. However, the amount of the portion used, and its relationship to the main subject of the copyrighted work could impact the fair use determination. The fourth factor is the potential market impact, which assesses the possible market effect of using the protected material. Liu (2019, pp. 163–166) notes that if the usage competes with or substitutes for the original work in the market, it may exclude a fair use determination. Fair use, on the other hand, maybe more likely to apply if the use does not negatively impact the original work's market or serves another market or purpose.

Additionally, (Gould et al., 2005, pp. 182-197) note that fair use assessment is not uniform and might vary depending on the unique circumstances of each instance. What constitutes fair usage in one context may not apply in another. As a result, librarians must perform case-by-case assessments to ensure legal compliance and reduce the danger of copyright infringement. Rathemacher (2012, pp. 230-238) further notes that libraries can increase access to knowledge and stimulate innovation while adhering to intellectual property law principles by prudently utilising fair use exemptions. However, (Graveline, 2011, pp. 92-96) notes that libraries must be watchful and knowledgeable about developments in copyright law to adjust their activities and reduce legal risks. Furthermore, continual education and training for library staff and users is critical for encouraging responsible and ethical usage of copyrighted content in academic institutions.

5 Academic libraries with copyright services

Over the past years, copyright services have evolved into new innovative services introduced by libraries to address the issues of copyright compliance, awareness, and education among users. A desk review was done on search engines to identify academic libraries with copyright offices and the specific roles of the staff in the offices.

Table 1: Some academic libraries with copyright services

	University Library	Country	Job Role/Office
1	Utrecht University	Netherlands	Copyright Information Office
2	University of Ottawa Library	Canada	Copyright Office
3	University of Alberta	Canada	Copyright Office
4	University of Johannesburg	South Africa	copyright services
5	Michigan State University	USA	Libraries Office of Copyright
6	Harvard University	USA	Copyright Services
7	Yale University Library	USA	Copyright Guidance Office
8	Rhodes University	South Africa	Copyright services
9	University of South Africa	South Africa	Copyright Services
10	University of West Cape	South Africa	Copyright Office
11	University of KwaZulu-Natal	South Africa	Copyright Officer
12	University of Ibadan	Nigeria	Copyright Services
13	University of Melbourne	Australia	Copyright Services
14	University of Calgary Libraries	Canada	Copyright Office
15	Aga Khan University	UK, KE, UG, TZ and PK	Copyright Office

There are considerable copyright services in academic libraries based in North America and parts of Europe. Notably, Africa has also embraced this emerging trend in service provision, specifically in South Africa and Nigeria. According to online data on websites and scholarly publications, Aga Khan University is the only academic library with a dedicated copyright office in East Africa.
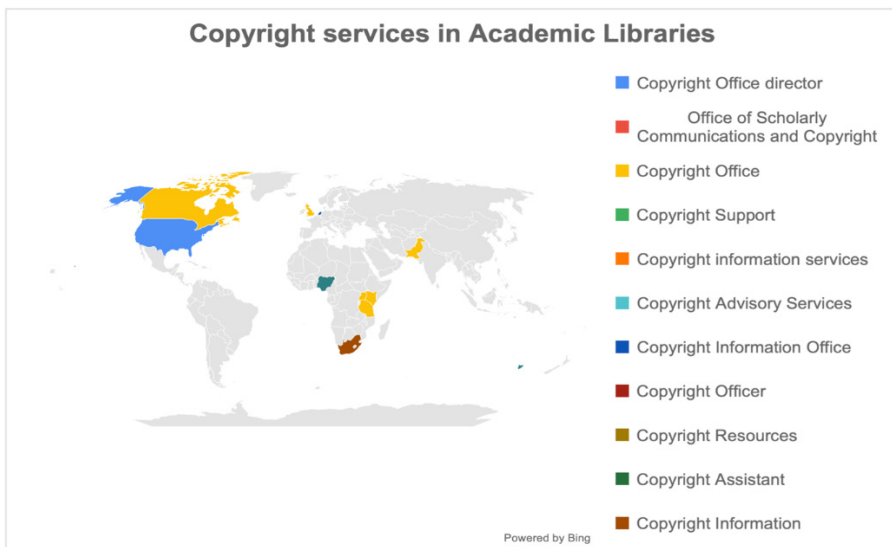
Figure 1: Geographical spread of copyright services in academic libraries

6 Copyright services at Aga Khan University libraries

Establishing a dedicated copyright office managed by copyright experts at the Aga Khan University (AKU) libraries demonstrates the university's dedication to ensuring copyright compliance in its institutional repository and other services. The office's establishment was in line with emerging trends in academic

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libraries in developing countries. Recommendations from ACRL and IFLA guidelines on copyright compliance in libraries also guided this. It demonstrated AKU's understanding of the significance of copyright law in academic research, teaching, and scholarship.

One significant role of the Aga Khan University libraries' copyright office is the emphasis on advising on copyright compliance in the institutional repository. Kawooya et al. (2015, pp. 341-349) note that copyright compliance in libraries is a specialised approach that recognises the distinctive roles of libraries and repositories in the scholarly environment and the specific copyright challenges they face in their operations. Through targeted initiatives, training programmes, and consultations, the AKU copyright office assists users in navigating copyright concerns about depositing, accessing, and publishing scholarly content by providing expert guidance and support. This responsive and user-centric approach improves the effectiveness and credibility of compliance efforts in its academic libraries and repositories.

Hanlon and Ramirez (2011, pp. 683–702) note that navigating the intricate world of copyright ownership and permissions is one of the most challenging tasks for institutional repositories to maintain compliance. Dawson and Yang (2016, pp. 279–294) further note that academic works may involve several stakeholders, such as authors, publishers, funding organisations, and institutions, each with their rights and interests in the materials. As a result, repository administrators must develop clear policies and procedures for verifying copyright ownership, acquiring required permissions, and successfully managing rights. Moreover, Leary et al. (2012, pp. 101–110) note that institutional repositories frequently include a variety of copyrighted works, such as journal articles, conference papers, theses, dissertations, and multimedia content. Each form of work may be subject to unique copyright issues, such as licencing agreements, embargo periods, or fair use exemptions. Repository managers must carefully check each item's conditions of use to guarantee compliance with applicable copyright laws and proper permission processes.

(Dunsire, 2008, pp. 51-58) notes that establishing strong metadata standards and usage policies can also aid copyright compliance in institutional repositories. Metadata enrichment enables repository users to understand the copyright status of materials by providing information about rights holders, usage restrictions and allowed uses. Clear usage policies define the terms and conditions for users to access, download, and reuse repository content, reducing copyright infringement and encouraging responsible use.

The AKU library copyright office provides specialised and targeted awareness and training on copyright knowledge. Quartey (2008, pp. 93-100), notes that proactive copyright awareness campaigns are critical to maintaining compliance within academic institutions. The AKU library copyright office provides authors, researchers, and repository users with training and resources on relevant copyright law, licencing choices, and best practices for using and citing copyrighted works. In addition to proactive measures, the copyright office develops robust methods for monitoring and combating copyright infringement. This includes frequent audits of repository material, automated copyright clearance techniques, and channels for reporting and resolving copyright issues presented by users or rights holders.

Moreover, the AKU copyright office assists in navigating the complexities of copyright law, particularly when it comes to incorporating third-party materials into their academic work. This includes helping faculty members understand the nuances of copyright clearance, licensing agreements, and the use of open-access materials. This involves negotiating licensing agreements with content providers to ensure that the university has the necessary permissions to access and use copyrighted materials by legal requirements.

Furthermore, the copyright office advises faculty, staff, and students on predatory material and publishing. This prevents the stakeholders from falling prey to unethical publishing cultures that do not follow the standard peer review process. In addition, it helps the stakeholders in assessing legitimate conferences and professional award events from predatory publishers. Additionally, these experts play a pivotal role in drafting policies to guide intellectual property (IP) use and ownership within the institution. These

policies provide clear guidelines and procedures for faculty, staff, and students regarding creating, using, and disseminating intellectual property. Overall, the AKU copyright office serves as a central hub for copyright compliance within the institution, keeping current on advancements in copyright law and best practices pertinent to academic libraries and institutional repositories. By promoting a culture of respect for intellectual property rights, the copyright office contributes to the university's mission of excellence in education, research, and service to society.

7 Conclusion

In conclusion, ensuring copyright compliance for academic institutions necessitates a multidimensional approach that includes policy formulation, metadata standards, training, and enforcement measures. Academic institutions can maximise the usefulness of their repositories by implementing effective copyright management systems that respect author rights and adhere to legal and ethical standards in scholarly communication. This approach helps protect intellectual property and fosters a culture of responsible and ethical use of copyrighted materials within academic settings.

8 Recommendations

Libraries can establish copyright services by conducting needs assessments to understand the copyright concerns of faculty, students, and staff. Based on feedback, they can design a suite of tailored services, such as consultation, copyright clearance for teaching resources, developing guides, training, and compliance for data curation. Dedicated copyright offices with specialists can provide individual consultations and integrate copyright training into the curriculum.

Academic libraries can offer seminars, workshops, and online modules on copyright to promote ethical use of copyrighted materials. Building knowledge and expertise in copyright law among librarians and staff can help establish copyright offices and services that enhance understanding and adherence to copyright law.

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16. Information Technology Trends, Challenges and Opportunities in Libraries

Naomy Mwaurah*; Nyambura Gathama**; Ben Namande***

*Boma International Hospitality College
nmwaurah@gmail.com

**Kenya Medical Training College
gathanyambura@gmail.com

***Kisii University
wekanamande@gmail.com

Abstract

Information technology has transformed library operations, allowing for the digitisation of collections, the adoption of advanced cataloguing systems, and the provision of virtual services. Librarians must understand emerging ICT trends in library and information services such as QR code, Web 2.0 and 3.0-based Services, EM and RFID implementation. This will help librarians meet the needs of their users in this era characterised by the digital revolution and information flood. Therefore, this study aimed to examine the IT trends and the challenges and opportunities they bring to the libraries. The study was a literature review guided by the following objectives: to examine the Information Technology trends in Libraries, to identify the opportunities of IT trends in libraries, and to discuss the challenges of IT trends in Libraries. The findings of the study were that ICT developments bring inherent problems. Libraries are dealing with digital equity concerns, ensuring that marginalised people have equal access to technical resources and materials. Cybersecurity worries loom big as libraries protect sensitive patron data and intellectual property from cyber-attacks and privacy violations. Furthermore, the rapid rate of technological progress requires continuous staff training and professional growth to effectively manage the complexity of new IT infrastructures. Amidst these challenges lie abundant opportunities for innovation and growth. The study informs and empowers libraries to leverage technology effectively to provide access to information, promote literacy, and foster lifelong learning in an increasingly digital world.

Keywords: *Virtual services, library services, librarianship, digitalisation*

1 Introduction

Universally, libraries are significant social institutions; a community cannot be considered complete without one. However, the impact of ICT is causing changes in libraries, including the needs of library users, resources, services, and products. The information landscape and access tools are also changing, trying to replace reference librarians. It is common knowledge that library professionals' roles are shrinking. Still, they are growing more significant as long as they stay updated with new developments in LIS and are not afraid to go outside the box (Funmilayo, 2020).

The Library and Information Science (LIS) profession has undergone metamorphosis due to technological changes. There has been a profound change in the theory and practice of the LIS profession over the years. The concept of librarianship has been changing according to the demands of society and the bewildering growth of information and communication technology. Now, the "custodian librarian" has grown into a "knowledge manager" and a "digital librarian." Abubakar claims these changes are "global, profound, and pervasive in nature" (Abubakar, 2021). They are also significant and inevitable despite causing changes in the information landscape and altering user needs, resources, services, and library products, according to Swayam (2020). Consequently, they indicate that LIS professionals' traditional duties are changing, necessitating a deeper analysis of the opportunities and challenges of emerging ICT trends in the LIS profession.

According to Satish (2023), emerging trends and technologies in library and information services include and are not limited to Library Automation, Digitalization, Institutional Repository and Digital Library Services, Consortia based Services, QR Code, EM and RFID implementation, Open Access, Outreach programs, Reference Management, Open Science, Virtual/Digital Reference Services, Ask the Librarian, Content Management, CAS/SDI services, Profiling System, Discovery Services, Web 2.0 and 3.0 based Services, Use of Social Media, Green Library Concept, to help in Ranking/Accreditation, Remote Login, Cloud computing, Mobile based Library Services, Use of Expert Systems and Robotics, Internet of Things, Augmented Reality Tools and Virtual Reality Tools, Semantics, Artificial Intelligence and Machine learning. Satish continues to argue that ICT trends provide many opportunities to improve library management and service delivery. For instance, electronic resource management software, radio frequency identification software (RFID), and cloud computing technology are currently used in libraries to track usage and access authorisation, track library inventory and theft, and provide virtual storage space for library electronic resources, respectively. Adopting these technologies into library service delivery results in 24/7 access to information needed, efficient tracking and management of library materials, increased collaboration and resource sharing among libraries, and increased research productivity in an institution. Nevertheless, the ICT trends in LIS bring along challenges such as changing patron needs, the information landscape, changing information formats, varying information access tools, the high cost of developing and maintaining the technological infrastructure of digital collections due to different human resource skill sets and modes of service delivery (Onuoha & Obialor, 2015).

The LIS professionals must understand these technologies and use them to provide relevant and reliable information to their users (Kaushik et al., 2019). To go along with the changes, it is crucial to understand the various emerging ICT trends in the LIS profession to revamp its education and embed it. This will help the LIS professional to satisfy the information needs of their users in this fourth industrial revolution characterised by the digital revolution, information flood, the Internet of things (IoT), and artificial intelligence (AI) (Ekoja et al., 2022).

The study's objectives were to examine the IT trends in libraries, identify the opportunities for IT trends in libraries, and discuss the challenges of IT trends in libraries.

2 Methodology

A title search was conducted in Google Scholar, Semantic Scholar and Crossref using Harzing's Publish or Perish software. Articles retrieved from each database were screened to untick those not eligible. The remaining articles were exported to different Microsoft Excel spreadsheets. They were then merged into one Excel sheet, and duplicates were removed. The inclusion criteria included peer-reviewed articles published between 2014 and 2024 that had full-text access and discussed information technology trends, challenges, and library opportunities. Snowballing was done to supplement the articles retrieved from the databases based on the relevant articles' reference lists. Although the literature search was extensive, it was exhaustive.

One thousand seven hundred twenty-four articles were retrieved and screened, and 1583 were irrelevant as they did not meet the inclusion criteria. One hundred forty-one articles were merged into Microsoft Excel spreadsheets, of which 56 articles were duplicates and were therefore removed. The remaining abstracts of 85 articles were reviewed, and 65 were excluded as they did not meet all the inclusion criteria. Twenty articles were left for review.

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3 Findings

3.1 LIS Profession in the Technological Era

According to Devi and Verma (2015), the LIS profession aims to give information to users at the appropriate time, place, and manner. Librarianship is classified as a profession because it possesses the following fundamental characteristics:

- A corpus of knowledge taught in LIS schools.
- Intensive training and practice to master knowledge organisation and retrieval skills;
- Service orientation;
- Professional associations;
- Standard terminology and practices;
- Code of Ethics.

Librarians were referred to as the custodians of information. Users with information needs were obliged to visit the library to satisfy their needs. Information sources were only available in print media, issued by the librarian, and were time-bound. The library's collection was guided by the community it served. This is, however, changing with the advent of technology. Librarians are no longer the custodians of information.

Consequently, patrons are not obliged to visit the library to satisfy their information needs. This results from the change in information format from print to electronic and the availability of various information storage and access tools such as search engines, databases, and institution repositories.

Libraries are also altering the services they provide, the collections they assemble, and the way they serve their users. This is due to the abundance of information and the various formats in which it is available, which have given rise to new roles for LIS. Verma (2015) studied libraries' changing roles and services in the 21st Century. The study describes the transformative evolution of libraries from the pre-technological to the technological period. According to Verma, libraries changed from one-medium to multi-medium information resources, library centres to libraries without walls, own procurement to procurement through consortia, service in good time to service just on time, local user to universal user, local reach of resources to global reach of resources, and print resources to hybrid resources (Verma, 2015).

These alterations demonstrate how new ICT affects library operations. These days, libraries offer technology-based services (Anand, 2018). These adjustments are necessary and appropriate for today's users. LIS professionals must understand these technologies to offer their users the best services possible (Kaushik et al., 2019). Capacity-building LIS professionals on new ICT trends can significantly impact their understanding of how to use these technologies (Anand, 2018), shifting their perspective from document custodians to information providers (Verma, 2015).

The duties of LIS workers in an information society have altered dramatically. LIS professionals may act in an information society as subject experts, Librarians with extended out-of-the-box responsibilities, Information Managers, Information Advisers/Instructor System and networking Managers, Information Broker for both print and electronic media, Change Agent, that is, Technology Application Leader Facilitator; Educator; Innovator/Website Designer/Manager; Database Manager; Collaborator; Policy Maker; Business Manager; Image Maker; Knowledge Manager (Muthu, 2014). To sustain these multiple roles, LIS professionals must have a variety of abilities, including IT skills, communication skills, management skills, learning and teaching skills, and so on, to run library services effectively and efficiently (Devi & Verma, 2015).

As Satish (2023) stated, an updated Librarian can, therefore, play the role shown in the figure below.

Figure 1: Updated Librarian's Responsibilities

3.2 Emerging ICT trends in libraries

3.2.1 Internet of Things

There has been much interest in the Internet of Things (IoT) in recent years. The IoT is the network connection of everyday physical things to exchange data via the Internet. It improves service delivery in organisations by enabling devices to communicate directly with the cloud and other devices (Igbinovia, 2021). Igbinovia (2021) defines IoT as "the interconnection of everyday objects or things for interaction and data exchange for planning, processing, or decision-making."

The best-integrated library and library management software (LMS) now uses the Internet of Things (IoT) to communicate data without human involvement. Libraries utilise IoT to manage inventory, deter theft, and identify users. It also contributes to increasing the quality and speed of circulation desk tasks. Furthermore, IoT speeds up book reservations, detects and prevents library fires, and streamlines eLibrary services (Satish, 2023).

3.2.2 Intelligent library search and federated search

Using a single query and search interface, information can be retrieved from multiple information sources via federated search and intelligent library search. The technique facilitates faster information retrieval for main libraries and facilitates indexing. Libraries use this technology for database searching, collection creation, descriptive cataloguing, and subject indexing (Satish, 2023).

3.2.3 Academic integrity and plagiarism

A review of current library system developments would be incomplete if it did not address plagiarism and academic integrity. Using someone else's words, ideas, theories, pictures, graphics, thoughts, or facts without giving them credit is known as plagiarism. Copying someone else's work compromises students' academic experience and intellectual integrity. Avoiding plagiarism has, therefore, become more crucial (Obialor & Onuoha, 2015).

3.2.4 Really Simple Syndication (RSS) feeds

Real Simple Syndication (RSS), also known as Rich Site Summary, is a technology that allows a website (or e-publisher) to list the most recent published updates (such as tables of contents of journals and new articles) using XML technology. It also enables users to follow updates to a particular website via RSS.

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Like a personal search assistant, RSS feed readers visit pre-defined websites, search for new content, and download it immediately to the user's desktop. Users can collaborate and republish content on the Internet. Users aggregate content from other websites into one spot, republish content from other websites on their own, and allegedly compress the Web for personal use. Libraries are already setting up RSS feeds to which users can subscribe. These feeds provide information about new objects in collections, new services, and new content in subscription databases. On their websites, they also reprint content (Funmilayo, 2020).

3.2.5 Streaming media

Streaming multimedia and distributing multimedia content over a computer network has been essential applications since before the Web. With computer and network infrastructure availability, library instruction has evolved to include interactive elements, such as multimedia-based tutorials using Flash programming, screen-cast software, or streaming audio or video. Libraries are now archiving and providing access to media through digital repository apps and asset management technology (Arora, 2020).

3.2.6 Tagging

According to Mondal (2020), tags are keywords or subject headings that describe information, allowing for keyword-based classification and search. They are often chosen informally by authors or audiences. Tags are commonly used to identify resources like files and digital photographs. Users can tag their collection in the library, contributing to the cataloguing process. This allows for standardised and user-tagged subjects, resulting in an open, personalised, user-centred catalogue (Funmilayo, 2020).

3.2.7 Social bookmarking services

Social bookmarking is storing, organising, searching, and managing website bookmarks based on descriptive metadata. In a social bookmarking system, users can save links to online pages they want to remember and/or share with others. These bookmarks can be made public, preserved secretly, or shared only with specific individuals or groups. Authorised users can usually examine these bookmarks chronologically, by category or tag, or through a search engine. Most social bookmarking systems encourage users to organise their bookmarks using informal tags rather than the standard browser-based folder structure. At the same time, some services include categories/folders or a mix of folders and tags. These sites also allow you to examine bookmarks connected with a specific tag and learn how many users have bookmarked them. Some social bookmarking services use tag relationships to construct tag or bookmark clusters. Libraries can employ social bookmarking sites with RSS feeds for subjects or areas of specialisation that are relevant to them (Funmilayo, 2020).

3.2.8 Mobile-based library services

A library's three main goals are to promote literacy, provide relevant, everyday information to the public, and inspire lifelong learning through reading materials and tools (Sethy, 2018). Verma (2015) reported that mobile libraries make resources available to users who would not otherwise have access to them. Libraries can use mobile technologies such as SMS and WhatsApp to create new services and provide speedier access to their collections. It also contains a learning management system (LMS), a software application that provides a framework for managing all parts of the learning process and tracking training content. Moodle is one of the top LMS software options available. The OPAC mobile app is a famous example of a mobile library service.

3.2.9 Artificial Intelligence

Artificial intelligence (AI) uses a computer's or robot's capabilities to attempt tasks that people usually complete. Chatbots are libraries' most often used AI applications; they take user inquiries and provide directed responses. They can direct users to the relevant library section, remind them of their book submission date, and schedule appointments for them automatically (Ajakaye, 2021).

3.2.10 RFID Implementation

RFID is a wireless, noncontact technology that uses radio frequency waves to send data from a tag affixed to an item, allowing it to be tracked and identified. RFID enables institutions such as libraries to implement self-service functions, maintain security, and monitor operations. Integrating IoT and RFID technology improves device communication by utilising radio frequency waves for data sharing. As a result, businesses employing the IoT framework can connect all kinds of items without using transducers, such as wireless sensors and actuators (Igbinovia, 2021).

RFID employs electromagnetic fields to choose automatically, and track tags affixed to library items. The RFID-based library management system is the most recent technology used to maintain inventory and improve library theft detection systems. This technology improves library security while increasing productivity by streamlining operations and eliminating human dependence. RFID helps users speed up the borrowing and returning processes. Consequently, RFID saves time and lowers library expenditures (Satish, 2023).

3.2.11 Electronic Resource Management

Electronic resources include e-journals, e-books, online databases, and other digital products that may be accessed electronically. Libraries can use e-Resource Management Software to track the collection, access, authorisation, maintenance, usage, evaluation, reservation, and selection of electronic information resources (Mohan, 2015).

3.3 Challenges of emerging ICT trends in libraries

The information age requires library workers to manage knowledge and grow personally because of the proliferation of information. Social shifts affect one's obligations, career opportunities, and self-perception. The current state of libraries has presented LIS professionals with new issues and difficulties due to the shift from print to hybrid collections that include electronic (online and offline) and print resources; automated systems have replaced manual systems for organising these materials; manual library services have given way to web-based library services; and so forth (Ashikuzzaman, 2021). Librarians' functions are significantly impacted by emerging ICT in LIS professionals.

Library workers encounter several issues when using ICT to disseminate information in libraries. The greatest challenge facing library workers today is the rapid growth in published literature. Information that has been released worldwide must be managed by library experts and distributed to information seekers. The majority of information is shared via ICT. Consequently, to provide clients with effective and efficient library services, they must be trained to stay up-to-date with the most recent technological advancements.

Another problem that affects library staff is inadequate technology infrastructure. This includes a dearth of national ICT policies, a shortage of PCs in libraries, inadequate Internet connectivity, and a finite amount of electricity. Regulations that control ISPs govern government and cross-border data flows, deregulate satellite communication and other telecommunication lines, and so forth are essential. ICT policies can mitigate the effects of strict tax regimes that still view peripherals such as computers and communication equipment as luxury goods, leading to exorbitant import duties and unreasonably high prices (Jamuna & Dhanamjaya, 2021).

Old technology becomes outdated due to the quick advancement and modification of technology. Because of this, library workers must be ready to pick up new skills and adjust to new technology to operate their libraries' daily operations successfully and efficiently.

Adequate funding is essential to sustain the standards and quality of library services. Most libraries face funding issues in many of their functions. The fast pace and transient nature of technological advancement necessitate ongoing investment.

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High-level technical support is essential to maintaining ICT in libraries. Library staff members must comprehend, utilise, and showcase developing technologies. Theresa and Revathi (2013) distinguished two unique problems requiring technical know-how. To begin with, not enough individuals are qualified for or are learning ICT-specific skills at the pace at which new technologies are being introduced. The second problem is brain drain, which is a phenomenon where some specialists depart for higher-paying occupations (Devi & Verma, 2015).

Technology-related stress. Technological stress is one of the biggest obstacles to using ICTs in the modern world. Technostress is defined as a novel adaptation problem brought on by an inability to make a healthy adjustment to contemporary computer technology. This could manifest as an over-identification with computers or a reluctance to adopt them. A negative psychological relationship between people and newly introduced technologies is another definition of technostress. Its five components are technological overload, invasion, complexity, insecurity, and uncertainty. In recent years, considerable effort has been put into improving library operations and service delivery by implementing cutting-edge concepts and technologies. The adverse physiological and psychological reactions that people experience to newly introduced technology are often the root cause of technostress (Olorunfemi & Adekoya, 2023).

3.4 Opportunities in emerging ICT trends in libraries

The library's issues have improved LIS personnel's ICT skills. Many corporations, government institutions, and institutions of higher learning offer LIS professionals ICT training so that they may stay abreast with the changes and trends in the library software used in the libraries (Kaushik et al., 2019).

Changes in the library system, particularly consortia acquisition, library networking for sharing of resources, interlibrary lending, provision of "walk-in users" in libraries, organisational membership of libraries, library publication activities, better marketing of library products and services, and so on, helped libraries to be economically viable daily despite reduced library budgets. Furthermore, various funding (both government and private), financial and labour help for library automation, the availability of open source software, and so on have considerably aided libraries in managing efficiently within a limited budget. (Mohammed et al., 2022).

Library services have evolved significantly since the introduction of ICT. The circulation area allows LIS personnel to check out and check in library materials more quickly through the library system (Devi & Verma, 2015). Thanks to Web OPAC, document searching has been made easier for users. OPAC also assists in determining the exact placement on the shelf for a specific library and how many copies of a particular document are available in the library, whether issued or not. Depending on the library software, reservations are also possible.

RFID technology is helpful for library transactions, inventory management, and theft detection. It automatically identifies and tracks the products using an identifying chip or tag. (Devi & Verma, 2015).

ICT apps enable libraries to manage and track ILL requests, send reminders, track monetary computations, and update users. Libraries use RSS feeds for communication, "Ask a Librarian" for real-time reference assistance, and social networking sites for marketing and information sharing. Website blogs can be used for book reviews, discussions, and job postings (Kaushik et al., 2019; Mohan, 2015).

The number of career prospects for LIS specialists has expanded significantly since the early days. Qualified experts can be hired in various settings, including libraries, information centres, research institutions, and corporations. New graduates can obtain hands-on experience by applying for the "Library trainee" position, which prepares them for better positions in the future.

According to Olubiyo (2022), the multiple changes to the library system and services have given LIS professionals and students greater control over research and publication activities. This has resulted in the

publication of a large number of books, both in print and online, worldwide. There are also many LIS PhD holders, which has boosted the reputation of the LIS profession and its practitioners.

Inforpreneurship is another opportunity presented to LIS professionals by emerging ICT trends (Mohammed et al., 2022). These online businesses sell their expertise worldwide by "repackaging and marketing their knowledge as information-based products, online services, and premium consultancy" (El-Kalash et al., 2016). According to Mohammed et al. (2022), some of these businesses are Information brokerage, information system consultancy, blogging and advertising, web development, database design, and Internet café.

Information brokers are individuals who search for information for the client for a fee. They typically have a deep understanding of the information landscape and can quickly identify and locate relevant information sources for their clients. Information brokers use electronic resources such as the Internet, databases, electronic libraries, books, and journals to source credible and relevant information for their clients (Mohammed et al., 2022). ICT, information retrieval, storage, and dissemination are required.

4 Discussion

The literature study focuses on recent and emerging ICT trends in the library profession. It also examines the problems and opportunities created by these trends. The study's findings demonstrate that in today's information society, ICTs are essential in libraries since they serve as the central engine of library growth and transformation. According to Olorunfemi and Adekoya (2023), automation software has transformed library operations from relying mainly on human labour to utilising technology to complete essential library duties. Librarians now employ ICTs to preserve records, store data, access information, and disseminate it.

WebOPAC, library websites, automation software, digital repositories, social media, mobile apps, digital resources, e-readers, RFID, barcodes, QR codes, cloud printing, web 2.0 and 3.0 technologies, and so on have all had an impact on library services in this digital age. According to Devi and Verma (2015), library professionals must adapt to the information age by managing knowledge and developing themselves. Societal changes impact responsibilities, job possibilities, and self-image. The recent library environment presents new challenges due to hybrid collection, automated systems, and shifts from manual to web-based services, significantly impacting library worker roles. As outlined in Swayam, librarianship has metamorphosed based on the needs of society and the growth of ICTS. This has led to various opportunities and challenges for the profession. Some of the identified challenges include changing user needs, developing a diverse pull of human resources with diverse skill sets for managing the new system, coping with increasing financial constraints, and technostress, among others.

The opportunities brought by the emerging trends, as discussed by Devi and Verma (2015), Mohammed et al. (2022) and Kaushik et al. (2019), include and are not limited to Increased job opportunities for LIS professionals, more significant influence towards research and publication activities, real-time reference services, easier to check-out and check-in library materials through the use of library management system, consortia mode of procurement, provision of ICT training facilities and intrapreneurship.

5 Conclusion

In today's digital age, emerging technologies provide librarians a unique opportunity to significantly enhance user-centred services while encouraging and enabling collaboration between libraries and their users. Adapting to some of these trends and implementing them is likely to boost libraries' status in the community. Some of these may be beneficial in attracting new library patrons. In contrast, others may help to retain the existing patrons or increase the importance of libraries as cultural and historical centres

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in their communities and academic institutions. These new developments make libraries more appealing, relevant, and acceptable. LIS schools are adapting their syllabuses to meet these challenges, producing ICT-skilled professionals. These professionals can pursue careers in the public, government, and private sectors, ensuring they meet the current job requirements and have ample career opportunities.

6 Recommendations

In light of the findings, the study offers the following recommendations:

- Implement a structured capacity-building program to continuously enhance the skills and knowledge of LIS professionals, ensuring they remain abreast of emerging ICT trends.
- A comprehensive LIS curriculum review is to be undertaken to allow adaptation and integration of modules that address emerging ICT trends. This may include hands-on experience through attachment and stakeholder collaboration, providing practical opportunities for LIS professionals.
- Library national bodies to establish a system of continuous assessment of LIS curricula, focusing on offering continuous professional development (CPD), points to librarians attending the training that aligns with emerging trends and opportunities in LIS professionals.
- Foster a culture of research and innovation in the LIS profession that focuses on emerging ICT trends. This could involve funding research initiatives focusing on ICT trends in the LIS profession.
- Advocate for adequate financial allocation to LIS departments to address the evolving information landscape due to ICT in the LIS profession, including investments in infrastructure and skilled personnel. This will ensure that LIS professionals have the resources to navigate and utilise emerging technologies effectively.

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17. Transformative Initiatives in Scholarly Communication: A Comprehensive Analysis of Crossref's Research Nexus, GEM Program, and PLACE

Mercury Shitindo

Africa Bioethics Network; Crossref

mercury.shitindo@gmail.com

Abstract

This study scrutinises transformative initiatives proposed by Crossref, such as the Research Nexus, the Global Equitable Membership (GEM) Program, and the Publishers Learning and Community Exchange (PLACE), as potential avenues for reform. At the heart of Crossref's vision lies the Research Nexus, an innovative initiative designed to construct a comprehensive network of interconnected relationships within the scholarly landscape. The Research Nexus bolsters research integrity, reproducibility, and discoverability by curating metadata and fostering connections among research entities. Through waived membership and content registration fees, the GEM Program champions inclusivity by granting all contributors access to Crossref's services and metadata, especially those in economically disadvantaged regions. Similarly, the Publishers Learning and Community Exchange (PLACE) functions as a vibrant online platform that supports organisations in embracing best practices in scholarly publishing, thereby enhancing the integrity of the scholarly record. These initiatives underscore the significance of establishing robust metadata and relationships among diverse research entities, enriching scholarly endeavours and amplifying the visibility and impact of research outputs. They advocate for embracing transformative initiatives to construct an inclusive infrastructure, address discipline-specific challenges like those encountered in social sciences and humanities, and reshape scholarly communication norms. Recommendations will be provided to foster collaboration, drive research evaluation reform, and champion inclusivity and diversity to steer future endeavours in advancing scholarly practices in the digital age.

Keywords: *Inclusivity, accessibility, innovation, research integrity, reproducibility, discoverability*

1 Introduction

Scholarly communication has undergone a profound transformation in recent years, primarily driven by the principles of open-access publishing and initiatives championed by libraries worldwide (Frank et al., 2023; Bergman, 2006). The democratisation of scholarly information remains a critical concern, particularly for researchers in under-resourced regions. The proliferation of article-processing charges (APCs) has sparked debates on equitable access to knowledge, emphasising the need to address disparities across borders and financial divides. (Vattikoti, 2019). Additionally, the unequal distribution of knowledge and scholarly work faces a myriad of hindrances that impede researchers' productivity and well-being. These challenges encompass various stressors within the academic environment that can either facilitate or hinder researchers' progress and success.

As the quest for universal access to research intensifies, addressing the disparities that hinder the free flow of knowledge across borders and financial divides becomes imperative. This paper delves into the transformative initiatives within scholarly communication aimed at overcoming some of these challenges and fostering a more inclusive and accessible research environment. By focusing on the initiatives proposed by Crossref, a key player in the scholarly publishing ecosystem, we aim to explore innovative solutions that can reshape the current scholarly communication practices.

This paper examines initiatives such as the Research Nexus, the Global Equitable Membership (GEM) Program, and the Publishers Learning and Community Exchange (PLACE) to highlight concrete steps

that can be taken to bridge the gap in scholarly publishing accessibility (Crossref, 2023). These initiatives envision a more interconnected scholarly ecosystem and advocate for inclusivity, diversity, and integrity in research dissemination.

By delving into these transformative initiatives and their potential impact on reshaping scholarly communication practices, this paper aims to provide insights into fostering collaboration, driving research evaluation reform, and advocating for a more inclusive infrastructure that transcends geographical and financial barriers. In doing so, we aspire to contribute to the ongoing discourse on advancing scholarly practices in an increasingly digital era. We offer insights and recommendations to create a more inclusive infrastructure and foster collaboration while advocating for research evaluation reform.

In conclusion, as stewards of information and access champions, libraries play a pivotal role in advancing the principles of open scholarship. By embracing openness, collaboration, and technological innovation, we empower researchers to share knowledge freely and address complex societal challenges (Pacific University Library, 2024).

2 Methodology

The methodology for this study involves a comprehensive analysis of the transformative initiatives within scholarly communication, focusing on the initiatives proposed by Crossref to address challenges and foster a more inclusive research environment. The study will utilise a qualitative research approach to explore the impact of these initiatives on reshaping scholarly communication practices.

A thorough academic literature review, including scholarly articles, reports, and publications related to scholarly communication, Open Access publishing, research dissemination challenges, and Crossref initiatives. Examine official documents, reports, and guidelines provided by Crossref regarding the Research Nexus, Global Equitable Membership (GEM) Program, and Publishers Learning and Community Exchange (PLACE). Contrasting the different initiatives (Research Nexus, GEM Program, PLACE) to understand their unique contributions and potential synergies in reshaping scholarly communication practices. Evaluating the impact of these initiatives on bridging gaps in scholarly publishing accessibility, promoting diversity, inclusivity, and integrity in research dissemination.

The findings of this study may be limited to the specific context of Crossref's initiatives and may not be generalisable to other scholarly communication platforms. By employing a rigorous research methodology encompassing literature review, document analysis and thematic analysis, this study aims to provide valuable insights into the transformative initiatives within scholarly communication proposed by Crossref. By integrating insights from academic literature with official reports and community discussions, our study ensures a holistic and well-rounded exploration of Crossref's initiatives in Africa (Crossref, 2023). This methodological approach enriches our understanding of the Research Nexus, GEM Program, and PLACE. It allows us to uncover these initiatives' practical implications and transformative potential within the African scholarly landscape.

3 Literature review

The landscape of scholarly communication is rapidly evolving, driven by transformative initiatives led by Crossref, which aim to reimagine information dissemination in the digital era. These efforts are reshaping how scholarly knowledge is organised, attributed, and interconnected, with a focus on metadata and Research Organization Registry Identifiers (ROR IDs) (ROR; https://ror.org/).

As of July 2023, Crossref holds a vast metadata store of over 146 million records (Lammey, 2023), facilitating the dissemination of scholarly information throughout the research ecosystem. The diversity of Crossref's membership, which includes universities, research institutions, library publishers, and funders, highlights the increasing importance of its metadata services. Open infrastructure and identifiers, such

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as ROR IDs, are crucial in establishing persistent links within the research ecosystem. ROR IDs support funding and publication workflows while promoting open science principles like access.

The Principles of Open Scholarly Infrastructure (POSI) are fundamental guidelines ensuring scholarly practices' transparency, governance, and sustainability (Bilder & Neylon, 2020). Crossref, a key player in scholarly communication, adheres to POSI to guarantee open access and integrity in its metadata services. This commitment aligns Crossref with other organisations like the Directory of Open Access Journals (DOAJ), PubMed Central (PMC), and Connecting Repositories (CORE), emphasising the importance of open access and scholarly integrity.

Crossref's practices, guided by POSI, focus on leveraging open infrastructure and identifiers like Research Organization Registry Identifiers (ROR IDs) to establish persistent links within the research ecosystem. ROR IDs are crucial in accurately attributing scholarly contributions by uniquely identifying research organisations globally. They enhance interoperability across scholarly infrastructure components, promoting accurate attribution and fostering inclusivity within the scholarly landscape.

At the heart of scholarly evolution lies metadata, which serves as a data descriptor, enhancing discoverability, integrity, and preservation of scholarly resources. A critical exploration of ROR IDs reveals their pivotal role in disambiguating institutional affiliations and fostering accurate attributions within the scholarly landscape. Universities, funders, and governmental bodies have to monitor and showcase the results of their investments, adhere to funder requirements, and formulate informed strategies, including decisions on future research funding allocations. Such information must be incorporated into Crossref metadata to facilitate these endeavours (Hendricks et al., 2022).

Despite these advancements, challenges persist, including technological barriers and the need for enhanced guidance in implementing new metadata standards. Crossref's initiatives, however, align with broader discussions on inclusivity, collaborative learning, and the significance of metadata in scholarly publishing.

In the next few sections, we will delve into Crossref's transformative initiatives, supported by comprehensive metadata and ROR IDs, and how they are reshaping scholarly communication, promoting inclusivity, and enhancing the integrity of the scholarly record. We will also consider existing challenges within the scholarly community.

We will also seek to understand the adoption of unique identifiers, including ROR IDs, within the African scholarly landscape, how these identifiers contribute to disambiguating entities, ensuring proper attribution, and breaking down barriers to scholarly participation in economically disadvantaged regions.

3.1 Metadata

Metadata is a set of data that describes and gives information about other data. It is simply data about data, providing a description and context (Atlan, 2024). It helps to organise, find, and understand data. Metadata can come in different layers, including descriptive, structural, administrative, reference, and statistical (Wikipedia). It can help users find relevant information, discover resources, organise electronic resources, provide digital identification, and archive and preserve resources.

In scholarly communication, metadata has different layers: descriptive, structural, administrative, reference, and statistical. (Greenberg, 2012). This multi-layered approach facilitates the organisation of electronic resources, aids in identifying digital content, and supports the archival and preservation of resources. Metadata plays a crucial role in helping users find relevant information, discover resources, and ensure the accessibility and long-term viability of digital assets.

Metadata plays a fundamental role in scholarly communication and is integral to Crossref's initiatives. The definition and examples provide a comprehensive understanding of metadata and its significance in

various contexts (Dataedo, n.d.). In the realm of scholarly communication, metadata serves the following key purposes.

Research Nexus heavily relies on metadata, emphasising the creation of interconnected relationships within the scholarly ecosystem. Descriptive metadata provides context to the relationships between different research objects, contributing to the overall understanding of the scholarly landscape. This metadata layer is vital for establishing the provenance and significance of scholarly work over time.

Metadata is the backbone, supporting the goals of inclusivity, knowledge exchange, and interconnectedness. The examples provided, such as metadata associated with photos, books, blog posts, emails, and Word documents, align with the diverse nature of scholarly outputs. These real-world instances underscore the versatility of metadata in providing context, aiding discovery, and ensuring the preservation of scholarly resources (Dataedo, n.d.).

As Crossref advances its transformative initiatives, the effective use of metadata becomes paramount in fostering a collaborative, accessible, and well-connected scholarly ecosystem. The insights gained from real-world examples and conversations contribute to a nuanced understanding of metadata's role in shaping the future of scholarly communication.

Crossref plays a pivotal role in orchestrating a cascade of metadata to signal crucial changes in the status of scholarly works. By harnessing the Research Nexus, Crossref endeavours to equip human and machine readers with contextual information essential for discerning the veracity of research claims. The interconnectedness of research objects underscores the significance of comprehensive metadata in elucidating the evolution of scholarly discourse. While citation remains instrumental in tracing the lineage of research, including preprints, grants, data, and software in metadata enriches the scholarly narrative. However, the full potential of metadata remains underutilised, necessitating concerted efforts to harness its power in shaping the scholarly landscape (Hendricks et al., 2022).

3.2 Research Organisation Registry Identifiers (ROR IDs)

This is a crucial component of scholarly communication. ROR IDs play a pivotal role in scholarly communication by providing a standardised way to identify research organisations globally. These unique identifiers are designed to uniquely and unambiguously represent academic and research institutions, ensuring accuracy and consistency in attributing scholarly contributions.

ROR IDs are part of a global, community-led registry that provides open, persistent identifiers for research organisations. The goal of ROR is to provide a persistent identifier (PID) for every research organisation in the world, similar to how ORCID provides persistent identifiers for researchers and DOIs provide persistent identifiers for research outputs.

ROR IDs are created and maintained through a centralised, community-based curation process. Anyone can suggest additions or updates to the registry. If an organisation has an ROR ID, it means it has been designated as a research organisation and has been or will be linked to research outputs and activities. (What Does it Mean to Be in ROR? n.d.). Inclusion in ROR does not imply anything about an organisation's reputation or ranking or the quality of the research it is associated with.

The significance of ROR IDs lies in their ability to facilitate accurate attribution by enabling precise identification of research organisations and eliminating ambiguity in authorship and institutional affiliations. This accuracy is vital for adequately attributing scholarly outputs, ensuring that contributions are correctly associated with their originating institutions.

They enhance interoperability across various scholarly infrastructure components, including publishers, repositories, and research information systems. ROR IDs promote seamless data exchange and integration within the scholarly ecosystem by providing a standardised identifier.

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In Crossref's Research Nexus context, ROR IDs create interconnected relationships among research entities. This includes establishing relationships between research organisations, researchers, and their outputs, fostering a comprehensive understanding of the scholarly landscape.

ROR IDs emerge as a critical enabler in reshaping scholarly communication, aligning with the goals of Crossref's transformative initiatives. The adoption of ROR IDs reflects a commitment to accuracy, interoperability, and inclusivity within the scholarly landscape, contributing to advancing research integrity and visibility.

3.3 Research Nexus: enhancing scholarly integrity and discoverability

The Research Nexus initiative embodies a forward-thinking approach to scholarly communication by emphasising interconnected relationships within the scholarly ecosystem. With the literature increasingly emphasising the importance of comprehensive metadata and establishing robust relationships between research entities, the Research Nexus initiative is at the forefront of reshaping scholarly interactions (Crossref Research Nexus, 2023).

At its core, the Research Nexus initiative enhances research integrity, reproducibility, and discoverability within the scholarly landscape. Crossref's commitment to research integrity is exemplified through services like the Similarity Check, which provides the iThenticate tool alongside a comprehensive database of scholarly content. This tool empowers Crossref members to verify the originality of submissions, ensuring the authenticity of scholarly work.

The Research Nexus enhances research integrity and reproducibility by fostering a network of relationships within the scholarly ecosystem, grounded in comprehensive metadata and the interplay between research entities (National Institutes of Health, 2024). This initiative emphasises the significance of relationships among diverse research objects, transcending conventional boundaries and adding intrinsic value to scholarly work. Additionally, organisations like the National Institutes of Health (2024) aim to enhance rigour and reproducibility in scientific research through principles that ensure funding the best and most rigorous science, highlight the need for detailed descriptions in grant applications, and emphasise the importance of reviewers considering such details. Open science initiatives also strengthen reproducibility by enhancing access to research data, reducing research waste, and increasing reliability through effective review and appraisal of results (APA, 2019). Furthermore, projects like TIER2 (2022) focus on boosting knowledge on reproducibility, creating tools, engaging communities, and implementing activities to enhance trust, integrity, and efficiency in research.

Amanda Bartell's seminal work in the "Integrity of the Scholarly Record (ISR)" series underscores the collaborative efforts essential to upholding research integrity. Published on April 26, 2023, Bartell highlights Crossref's pivotal role, alongside its partners and integrators, in establishing and maintaining infrastructure that captures and preserves the scholarly record. The Research Nexus, facilitated by Crossref's infrastructure, provides stakeholders—from researchers to publishers to readers - with contextual understanding, enabling informed decisions regarding the trustworthiness of research outputs and the entities behind them. Overall, these initiatives collectively contribute to promoting transparency, rigour, and reproducibility in scholarly research endeavours.
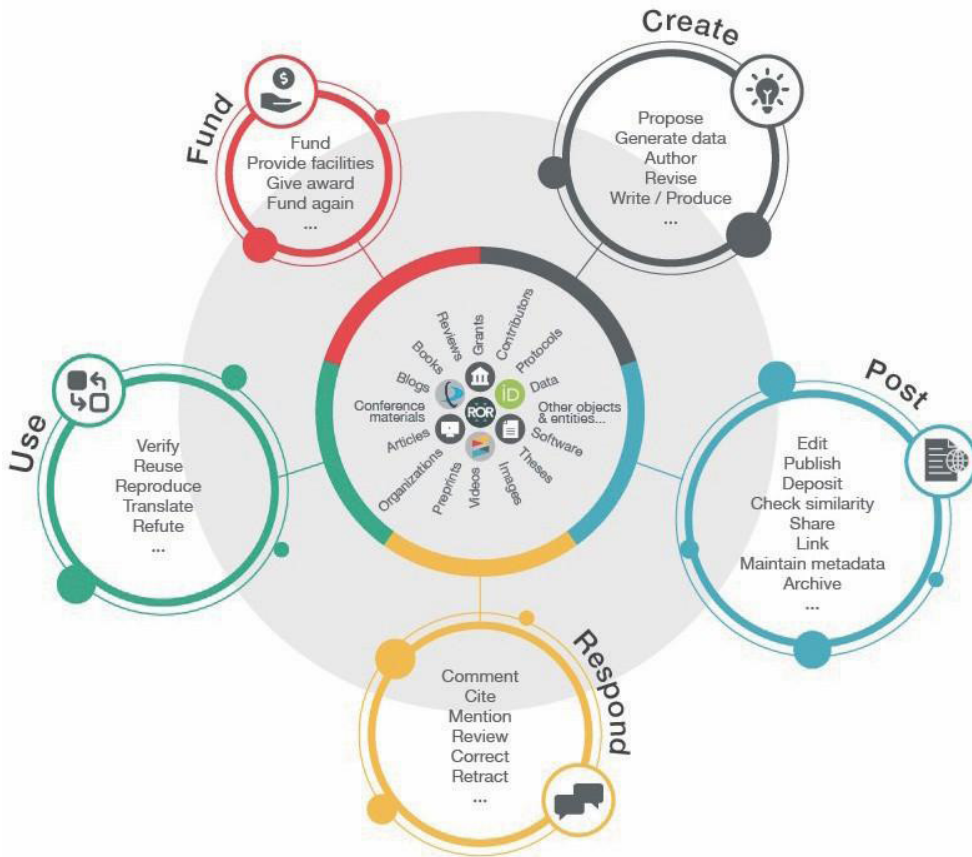
Figure 1: Diagram depicting the relationships of interest groups and Crossref services for realising the vision of the research nexus

The Research Nexus vision emerges as a transformative force in scholarly communication by emphasising the interconnectedness of research entities (Crossref, 2023). The discussion underscores its role in elevating traditional bibliographic references to a more comprehensive web of relationships. By advocating for transparent and interconnected scholarly records, Research Nexus contributes to research integrity and facilitates a more nuanced understanding of the scholarly impact on society. The section discusses the paradigm shift by Research Nexus, envisioning a future where the depth and breadth of scholarly connections are integral to evaluating and appreciating research outputs.

3.4 Global Equitable Membership (GEM) programme

Crossref's GEM Program is a pioneering initiative aimed at democratising access to scholarly services and metadata, acknowledging the significance of inclusivity in scholarly communication (Crossref GEM, 2023). Traditionally, financial barriers have hindered access to scholarly resources, particularly for contributors from economically disadvantaged regions. The GEM Program addresses this by eliminating membership and content registration fees and fostering a more inclusive global research community (Crossref GEM, 2023).

The program offers relief from membership and content registration fees for members in the least economically advantaged countries globally. Organisations in GEM-eligible countries can join as full

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members and register their content and related metadata free of charge, aligning with Crossref's vision of a rich and reusable scholarly record (Crossref launches Global Equitable Membership programme, 2022).

To facilitate participation from financially underprivileged countries, Crossref collaborates with organisations like the Public Knowledge Project and partners with INASP and African Journals Online (AJOL). These initiatives, including the GEM program, aim to help organisations overcome financial, administrative, and technical challenges in contributing to the global scholarly record (Crossref launches Global Equitable Membership programme, 2022).

The list of countries eligible for the GEM program is curated based on sources such as the International Development Association (IDA). It undergoes an annual review to align with the latest economic data (Crossref launches Global Equitable Membership programme, 2022). Through such initiatives, Crossref underscores its commitment to fostering a more inclusive, accessible, and interconnected research ecosystem.

GEM fosters inclusivity and accessibility in scholarly communication, particularly within economically disadvantaged regions (Crossref, 2023). By alleviating financial barriers through fee relief, GEM ensures broader participation, thereby enhancing the global diversity of contributors to the scholarly ecosystem. The discussion underscores GEM's pivotal role in democratising access to Crossref's services, ultimately contributing to a more comprehensive and representative scholarly record.

3.5 Publishers Learning and Community Exchange (PLACE)

PLACE emerges as a dynamic online forum within the scholarly publishing landscape, fostering knowledge exchange and collaborative learning among publishers. The literature underscores its role as a consolidated resource hub, promoting best practices, supporting newer publishers, and enhancing scholarly record integrity.

PLACE, hosted at the place.discourse.group, is a new online public forum for organisations interested in adopting best practices in scholarly publishing. It offers a one-stop shop for accessing information from multiple agencies, engaging with experts, and participating in peer discussions.

While pivotal to scholarship, scholarly publishing presents challenges, especially for new and resource-constrained publishers. The complexity of regulations and standards can be daunting, making it difficult for publishers to navigate. PLACE addresses these challenges by providing consolidated, easily accessible information and fostering open exchange among publishers.

PLACE is the result of collaboration between esteemed organisations such as the Committee on Publication Ethics (COPE), Crossref, the Directory of Open Access Journals (DOAJ), and the Open Access Scholarly Publishers Association (OASPA). This partnership aims to streamline information access and support publishers adopting industry best practices.

The platform caters to publishers with limited resources, offering invaluable support and guidance. Recognising the importance of a diverse and equitable publishing community, PLACE seeks to empower smaller, scholar-led publishers, particularly those from low-income countries.

PLACE simplifies finding relevant information and seeking support by offering a centralised platform for inquiries and discussions. Publishers can navigate policies, standards, and criteria more effectively, minimising financial and technical barriers to participation.

Each participating organisation is dedicated to lowering barriers to participation and providing enhanced support for publishers worldwide. Through collaborative efforts and shared goals, PLACE is committed to fostering a vibrant, inclusive scholarly publishing community.

The PLACE represents a transformative initiative to support publishers in adopting best practices and navigating the complexities of scholarly publishing. By offering accessible information and fostering collaboration, PLACE enhances scholarly record integrity and promotes a more equitable global publishing landscape.

The PLACE initiative emerges as a vibrant knowledge exchange platform, promoting best practices in scholarly publishing (Crossref, 2023). PLACE empowers publishers by providing a consolidated space for information exchange, primarily benefitting newer entrants. The discussion emphasises the ripple effect of such knowledge-sharing, contributing to individual publishers' growth and enhancing scholarly record integrity. This collaborative ethos fosters a community-driven approach to addressing challenges and advancing scholarly communication.

3.6 Alignment with other organisations

Crossref's commitment to POSI aligns it with other prominent organisations. In the context of scholarly communication, the alignment of Crossref with other prominent organisations, such as the Directory of Open Access Journals (DOAJ), PubMed Central (PMC), and Connecting Repositories (CORE), underscores a collective commitment to principles of open access and scholarly integrity within the academic community. These organisations collectively emphasise the critical importance of open access to knowledge and promoting scholarly integrity, reflecting a shared vision for advancing accessibility and transparency in research dissemination (Crossref, 2023).

The Directory of Open Access Journals (DOAJ) is a comprehensive directory of high-quality, peer-reviewed open-access journals promoting global access to scholarly research. PubMed Central (PMC) is a free full-text archive of biomedical and life sciences journal literature, supporting open access to valuable scientific information. Connecting Repositories (CORE) is vital in aggregating open-access research outputs from repositories worldwide, facilitating seamless access to a diverse range of scholarly content.

By aligning with these organisations, Crossref reinforces its dedication to fostering an inclusive and collaborative scholarly ecosystem that transcends geographical and financial barriers. The collective efforts of Crossref, DOAJ, PMC, and CORE underscore a shared commitment to promoting open access, enhancing research visibility, and upholding scholarly integrity across the academic landscape. This alignment strengthens the foundation of open scholarship and underscores the importance of collaborative initiatives in advancing knowledge dissemination to benefit the global research community.

3.7 Challenges and opportunities

While these initiatives bring significant advancements, challenges in scholarly publishing persist. As various studies have identified, technological barriers hinder the seamless adoption of new metadata standards and relationship metadata. The literature emphasises the need for enhanced guidance, best practices, and community-driven solutions to overcome these challenges. The challenges identified in the literature mirror the complexities publishers, researchers, and infrastructure providers face in implementing transformative initiatives within the scholarly communication ecosystem.

In close collaboration with its partners and integrators, Crossref assumes a pivotal role in capturing and safeguarding the scholarly record. This robust infrastructure ensures that research outputs are readily accessible to humans and machines through meticulously curated metadata and relationships. By furnishing comprehensive context through metadata and relationships, the Research Nexus initiative effectively raises the bar against attempts to misrepresent information as trustworthy. The transparency and accessibility of information fostered by Crossref contribute significantly to upholding the integrity of the scholarly record, thus fortifying the foundation upon which scholarly discourse thrives.

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Proactive measures are needed to overcome technological barriers, enhance stakeholder guidance, and foster a cultural shift toward recognising the value of metadata and interconnected relationships. Simultaneously, it positions these challenges as opportunities for collaborative solutions, emphasising the role of community engagement in driving positive change. The multifaceted impact of these initiatives (GEM, PLACE, and Research Nexus) on the scholarly landscape (Crossref, 2023) is geared towards a more inclusive, collaborative, and interconnected future.

The emergence of transformative initiatives like Research Nexus, GEM, and PLACE by Crossref has generated new knowledge in scholarly communication. These initiatives emphasise interconnectedness, inclusivity, and knowledge exchange within the research ecosystem. These initiatives introduce novel concepts such as Research Organization Registry Identifiers (ROR IDs) and comprehensive metadata to reshape how scholarly knowledge is organised, attributed, and interconnected.

Applying these new concepts in scholarly communication can lead to a more transparent, inclusive, and well-connected research landscape that fosters collaboration, accessibility, and integrity in academic endeavours.

4 Findings

The findings presented in this section offer valuable insights into the impact and challenges associated with Crossref's initiatives, namely the Research Nexus, Global Equitable Membership (GEM) Program, and Publishers Learning and Community Exchange (PLACE). They shed light on new knowledge generated and its potential applications in scholarly, policy, and practice development within the discipline.

4.1 Metadata expansion and diversity

The analysis highlights a significant increase in metadata reported to Crossref, indicating a robust growth trajectory. Implementing GEM and PLACE has increased participation among diverse stakeholders, showcasing progress towards a more inclusive scholarly record. This newfound knowledge can be applied in scholarly circles to emphasise the importance of comprehensive metadata reporting for enhanced discoverability and research integrity. Policymakers can leverage this insight to advocate for broader participation in metadata reporting standards, while practitioners can utilise this data to improve their research visibility and impact.

4.2 Diverse content registration

A noticeable trend emerges in the increased registration of various content types. GEM's impact is evident in fostering greater participation, particularly in the rising registration of datasets and peer review reports. As a knowledge hub, the PLACE initiative contributes to a diverse registration landscape by promoting best practices among publishers. This knowledge can inform scholarly practices by encouraging a more diverse range of content registrations, leading to a richer scholarly ecosystem. Policymakers can use this information to support initiatives that promote diverse content registration standards, while practitioners can benefit from increased access to varied research outputs.

4.3 Establishment of interconnected relationships

The Research Nexus vision has facilitated intricate relationships among different research objects beyond traditional bibliographic references. This emphasises the importance of holistic relationships within the scholarly ecosystem. This new understanding can guide scholars in forming comprehensive connections between research entities for improved research integrity and discoverability. Policymakers can consider promoting initiatives that encourage interconnected relationships within scholarly communication, while practitioners can enhance their research impact by fostering meaningful connections between various research objects.

4.4 Challenges in adoption and implementation

Despite positive advancements, challenges persist for publishers, researchers, and infrastructure providers. The complexities of adopting new metadata standards like ROR IDs and grant information present hurdles. Siloed thinking among stakeholders hampers seamless integration of relationship metadata, highlighting the need for enhanced guidance and best practices. This insight can guide policymakers in developing supportive frameworks for overcoming adoption challenges, while practitioners can benefit from understanding common hurdles in implementing new metadata standards.

By synthesising these findings, stakeholders across scholarly, policy, and practice domains can comprehensively understand the tangible impacts and challenges associated with Crossref's initiatives. This knowledge is a foundation for driving positive change within the discipline by promoting inclusive practices, fostering diverse content registration, enhancing interconnected relationships, and addressing adoption challenges for sustainable scholarly development.

5 Recommendations

The insights from examining Crossref's transformative initiatives – the Research Nexus, GEM and the PLACE – offer valuable guidance for advancing scholarly communication in Africa. By synthesising these findings and proposing actionable recommendations tailored to address Africa's unique challenges and opportunities, Crossref can further strengthen its commitment to inclusivity, knowledge exchange, and interconnected relationships within the African scholarly community. Through strategic engagement with stakeholders, capacity-building initiatives, localised resources, cross-sectoral collaborations, continuous evaluation, and adaptation efforts, Crossref can play a pivotal role in enhancing research visibility, integrity, and impact across the continent. The specific recommendations are summarised hereunder.

- **Stakeholder engagement -** Actively engage with African research institutions, funding bodies, and publishers to advocate for adopting Research Nexus principles and emphasise the benefits of interconnected research relationships.
- **Capacity-building initiatives -** Provide training and capacity-building initiatives focused on metadata enrichment, relationship establishment, and open scholarly infrastructure to enhance Research Nexus implementation.
- **Collaborative research projects -** Encourage collaborative research projects that leverage the Research Nexus vision to explore the global impact of African research outputs.
- **Foster awareness -** Conduct targeted outreach and awareness campaigns to ensure that academic institutions, researchers, and publishers across Africa are well-informed about the GEM Program's benefits (Crossref, 2023).
- **Collaboration with local entities -** Establish collaborations with regional academic and publishing organisations to strengthen the GEM Program's impact within the African scholarly community. Streamlined application processes: Simplify and streamline the application processes for GEM participation, ensuring accessibility for various institutions and individuals.
- **African-centric content -** Develop and curate content on the PLACE platform that addresses the challenges, best practices, and success stories relevant to the African scholarly publishing context.
- **Regional workshops and webinars -** Organise workshops and webinars tailored to the needs of African publishers, offering practical insights into effective scholarly publishing practices.
- **Collaborative networks -** Facilitate the creation of collaborative networks among African publishers through PLACE, fostering a supportive community that shares knowledge and resources.

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- **Governmental involvement -** Advocate for the involvement of governmental bodies in supporting and endorsing initiatives like GEM, PLACE, and Research Nexus to ensure sustained and widespread adoption.
- **Industry partnerships -** Foster partnerships with industry stakeholders, including technology providers and funding agencies, to strengthen the technological infrastructure supporting these initiatives.
- **Academic community involvement -** Encourage active participation and feedback from African researchers, authors, and academic institutions in shaping these initiatives' ongoing development and evolution.
- **Regular assessment -** Implement a system for regularly evaluating the impact of GEM, PLACE, and Research Nexus in the African context, focusing on identifying improvement areas.
- **Feedback mechanisms -** Establish feedback mechanisms that allow the African scholarly community to provide insights, suggestions, and concerns, fostering a collaborative approach to refinement.
- **Flexibility and adaptability -** Maintain a flexible approach, allowing these initiatives to evolve based on the changing needs and dynamics of the African scholarly landscape.

By strategically implementing these recommendations, Crossref can further strengthen its commitment to inclusivity, knowledge exchange, and interconnected relationships within the African scholarly community, contributing to advancing research visibility, integrity, and impact across the continent.

6 Conclusion

The triad of Crossref's transformative initiatives – the Research Nexus, GEM and the PLACE – collectively signifies a pivotal shift in the scholarly communication landscape (Crossref, 2023). These initiatives, each playing a distinctive role, converge to reshape the dynamics of inclusivity, knowledge exchange, and scholarly interconnectedness.

Research Nexus emerges as a visionary, advocating for an interconnected research landscape (Crossref, 2023). By emphasising the significance of relationships between various research objects, Research Nexus enhances research integrity, reproducibility, and discoverability. This interconnectedness expands the scope of scholarly impact assessment, positioning scholarly work within the broader context of societal influence.

GEM emerges as a beacon of inclusivity, illuminating pathways for wider participation in scholarly communication (Crossref, 2023). By addressing financial barriers and providing relief to eligible members, GEM is a testament to Crossref's commitment to democratising access. The inclusivity fostered by GEM enriches the global scholarly ecosystem by amplifying diverse voices and transcending economic constraints.

PLACE catalyses knowledge synergy and growth within the scholarly publishing community (Crossref, 2023). Offering a collaborative platform for information exchange empowers publishers, especially newcomers, with the tools and insights needed for success. The ripple effect of this knowledge-sharing extends beyond individual publishers, contributing to an elevated standard of scholarly record integrity.

The challenges identified through the analysis underscore the ongoing evolution required in technological infrastructure, stakeholder guidance, and cultural perceptions (Crossref, 2023). However, these challenges are not roadblocks but rather signposts indicating areas for collaborative solutions. The conclusion emphasises the importance of ongoing community engagement, proactive measures, and a collective commitment to realising the full potential of these initiatives.

As we navigate the evolving landscape of scholarly publishing, the amalgamation of the Research Nexus, GEM and the PLACE signifies a holistic approach toward building a more accessible, collaborative, and

interconnected scholarly future (Crossref, 2023). Crossref's commitment to these initiatives reflects a dedication to advancing scholarly communication, transcending geographical, financial, and disciplinary boundaries. The journey towards a scholarly landscape enriched by inclusivity, knowledge exchange, and interconnected relationships continues, propelled by the collective efforts of the global scholarly community. Through shared infrastructure and transparent practices, the scholarly community can work together to ensure the credibility and reliability of research outputs.

As Crossref continues to evolve its initiatives and engage with the African scholarly community, it is essential to maintain a collaborative approach that prioritises feedback, flexibility, and responsiveness to the dynamic needs of researchers, publishers, and infrastructure providers. By fostering a supportive ecosystem that embraces diversity and innovation, Crossref can contribute significantly to shaping a more inclusive and robust scholarly communication landscape in Africa and beyond.

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18. Effectiveness of Reference Management Software in Enhancing Research Quality in Universities in Nairobi County, Kenya

Samuel Kairigo*; Everlyn Anduvare**

*Kibabii University

samuel.wakahia@gmail.com

**Karatina University

varelynn@gmail.com

Abstract

Reference management software (RMS) application is highly emphasised in academic research to improve research quality. However, studies raise concerns about their effectiveness since they have errors in functionality, language limitations, and inaccuracy of the citations and references generated. This study aimed to establish how effective RMS is in improving research quality. The study objectives were to investigate what reference management software is in use in the universities in Nairobi County, Kenya and to establish if reference management software programmes are effective in enhancing the quality of research in the selected universities. The study adopted a descriptive research design. This assisted the researchers in gathering data through a survey where an online questionnaire was administered to 18 respondents. All the universities within the County of Nairobi constituted the target population. The unit of analysis was the University Librarians because of their crucial role in promoting research quality in Kenyan Universities. In the analysis, insights were derived using a computer-based statistical package for social science (SPSS). The study revealed high satisfaction with RMS, particularly in terms of necessity, visual appeal, integration capabilities, and automatic formatting of references. While University librarians reported ease of navigation, there was limited awareness of alternative referencing approaches. Continuous institutional training programs for librarians and researchers on RMS usage, covering basic and advanced functionalities, are recommended.

Keywords: *Academic integrity, citation and referencing, reference management software, Kenya*

1 Introduction

The application of reference management software (RMS) to generate accurate in-text citations and references is looked at by researchers and students as an essential time-saver when writing research (Basak, 2014). In a research conducted by Madhuri and Lakshmi (2021), it was revealed that in India, Library and Information Science researchers who use RMS solely to edit and format references account for 35% of the population within this profession. RMS tools quicken organising, storing, and formatting references and citations. Hence, the accuracy through which the references and citations are captured is enhanced, and error margins are reduced.

Marsh and Campion (2018) further opine that apart from poor summarisation and paraphrasing skills, the lack of practical skills needed to produce in-text citations and references is therefore seen as distinct and essential for learning advisors, librarians, and teaching faculty to address whenever a challenged researcher or student needs guidance. It, therefore, becomes the obligatory role of higher education institutions to assist in accurately imparting the requisite competencies regarding citing and referencing.

2 Reference management software

Many researchers perceive the reference management process as time-consuming and tedious, more so when done manually. However, with the inception of citation management software programs, the process

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has been made comparatively easier, cheaper, and more social (Fenner et al., 2014). Additionally, the conduct of research is faster when using these citation management software programs than when doing it manually because of their built-in library components, which save collected bibliographic descriptions that can be referred to in the future (Rempel & Mellinger, 2015). Various categories of reference management software are used to generate references and citations. At the University of Manitoba, for instance, the top four programmes that the students use are as follows: Mendeley (39%), EndNote (20%), Zotero (16%) and RefWorks (10%). Other software programs used in small fractions include Papers, Qiqqa, Docear, EndNote Web, ReadCube, Bookends, BibTeX, and Refme Web. Though not technically reference managers, the options mentioned include Microsoft Word and Evernote with Microsoft Word (Speare, 2018).

Panda (2023), in his research, reports that Google Trends places Mendeley as the most on-demand reference management software program with the highest average frequency at 79.06 hits per week. Panda further reveals that Zotero and EndNote come second and third, respectively, with 57.62 and 48.44 weekly hits. Citavi has 14.19 weekly hits, and Qiqqa received no searches during the past 52 weeks. Research has proven that the perceived usefulness of citation management software, perceived ease of use, and user acceptance of the software tool packages have a noteworthy impact on research output (Basak, 2016; Farag, 2019).

RMS are available in a wide range, and their users feel that in terms of their features, they all have their strengths and weaknesses, which may vary from one program to the next (Fenner et al., 2014). Farag (2019) suggests that referencing tools emerge as essential when considering how much time they save researchers, especially when they need to generate and organise references and in-text citations. Farag further opines that scholars prefer using them because of their capacity to enhance the storage and sharing of bibliographic information. "Ease and rapidity of use are highly valued", and most researchers prefer sticking to a system already working for them rather than an upgrade (Francese, 2013). This, hence, points to the need for consistent support when the referencing system malfunctions or prompts the researcher in question for an upgrade of the tool.

Research has revealed that the feature of networking and sharing bibliographical information is preferred by university lecturers, professors and field practitioners than by research students because of the stages of research each of the groups of users may be at and how crucial the aspect of networking may be in such a group. Research has also revealed that scholars or people working in institutions of Higher learning may, to a great extent, be aware of the existence of citation management software programs. However, some may not use them, especially if they are not freely available or the institution they work for does not invest in any specific one; others lack the initiative to dedicate some time to learn about how they can benefit from new tools (Osmani et al., 2016; Francese, 2013; Emanuel, 2013), while others, especially the ones in pursuit of undergraduate programs, are not willing to transition to sophisticated reference management software programs if they already have the Microsoft word referencing option working for them (Rempel & Mellinger, 2015). Users may prefer one tool to another due to recommendations about citation management software programs given by friends or colleagues (Emanuel, 2013). Others, especially junior faculty members, adopt specific software programs based on recommendations strongly suggested or dictated by a knowledgeable lead person within a department (Rempel & Mellinger, 2015).

According to Shuman (2021), the most suitable citation and referencing software program must allow direct importation of bibliographic description details from a web browser and the ability to import the exact details into other software programs. Shuman further argues that a good quality citation management software program should have a cloud-centred database that enhances the storage of bibliographic metadata, which can be retrieved at the researcher's convenience. Other researchers should be able to easily locate literature that relates to the references indicated with the help of robust citation management software. According to Sungur and Seyhan (2014), the software should be compatible with the operating system and not consume much disk space. Sungur and Seyhan further opine that it should have a friendly

user interface, encompassing the capability to transfer required references appropriately into another program and enhance the organisation of the entire manuscript.

3 Effectiveness of reference management software in academic institutions

Reference management software programs are systems, and when evaluating the levels of effectiveness of a system, two things are considered. These two are the system's effectiveness when meeting the needs of the users and the efficiency levels the system demonstrates to produce results for the users (Hamilton & Chervany, 1981). Tech Talk (2015) outlines three evaluation measures for assessing a system's effectiveness. These are technical effectiveness, operational effectiveness, and economic effectiveness. Tech Talk further opines that when assessing the operational effectiveness of any system, the system must be evaluated for its frequency in terms of usage, ease of use, levels of user satisfaction and even the system's nature of usage. Therefore, to be effective, reference management software should guarantee user satisfaction regarding the accuracy of the citations and references generated. Metadata cleanup after importing bibliographic descriptions for reference and citation generation should be minimal. The reference management software program should be one the users prefer to utilise and use frequently. It should be a software program with a user interface that is straightforward and not complicated. The users should be able to operate the software independently and comfortably achieve results.

Research has been done on the functionality and nature of reference management software programs, but very few studies have initially demonstrated their effectiveness in research enhancement (Francese, 2013). One of the drawbacks of using reference management software is that they do not capture the bibliographic description details to perfection, hence requiring metadata cleanup of mismatches resulting from the import process. Another drawback is that most citation management software programs only allow the formulation of in-text parenthetical citations with no provision to formulate narrative citations at the beginning when a researcher needs to introduce a quote. Users of these software applications require Internet connectivity to appreciate their full functionality. These reference management software tools can be complex and time-consuming, especially when it comes to establishing and learning how to use them, which makes some researchers who are potential users eventually shun them (Meredith, 2012).

In addition, most of these software cannot collaborate through importing or exporting metadata to other brands. Some even cause complexities during the deletion of duplicated bibliographic records (Lorenzetti & Ghali, 2013); most of them do not come with manuals, and those with available documentation may be frustrating to use, especially in cases of incompatibility with some unfamiliar machines and their operating systems (Rempel & Mellinger, 2015); while a majority of them do not support specific languages like Arabic and other African dialects.

Given these glaring issues, it begs the question of whether referencing tutorials on how to use RMS are appropriately given in institutions of higher learning, and, if so, how effective they are at making citation and referencing processes easier. This paper addresses two research questions: Which reference management software programs are used in the Universities based in Nairobi County, Kenya, and secondly, how technically, operationally, and economically effective are reference management software in enhancing research quality in universities based within Nairobi County, Kenya.

4 Methodology

Descriptive research design, the preferred research approach, is a research methodology that provides a detailed account or description of a phenomenon without manipulating or altering the variables under investigation (Creswell & Creswell, 2017). The primary objective of descriptive research is to observe, record, and analyse the characteristics of a population or phenomenon to understand its nature and features

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(Saunders et al., 2019). This study sought to establish the effectiveness levels of reference management software programs that are informed by perceptions from certain groups of people. The research sought to explore, hence, the levels of effectiveness or ineffectiveness attributed to the use of reference management software in the enhancement of research to inform the information literacy policymakers who are based within Nairobi County, hence the adoption of the approach to this research. The research focused on university librarians because they promote the use of these softwares during the information literacy training programmes and are in a better position to understand the challenges each one of them possesses. They are also researchers in their capacities and, therefore, use them to organise citations and references in their research and for other academic-related tasks such as populating the newly developed and revised curriculums. An online questionnaire was sent to university librarians in the specific universities, who, in turn, filled them out to inform the research. Commission of University Education (CUE) has been mandated to list Universities accredited to undertake university education in Kenya through section 28(4) of the Universities Act of 2012. CUE lists 23 Universities located in Nairobi County. Those that are fully chartered and those operating with a letter of Interim Authority at 18 and 5, respectively. The study was carried out in all 18 fully chartered universities within Nairobi County, Kenya, which has adopted a consistent sensitisation approach to enhance the Information Literacy levels of their researchers; hence, the adoption and use of reference management software. Data was analysed using SPSS to generate the actual percentages and the mean and standard deviation scores. This data was presented in tables and charts as a representation of the information provided by the respondents throughout the study.

5 Findings

A total of 18 university librarians participated in this study, accounting for a 100% response rate. The study findings are thematically presented and interpreted in line with the two research questions. Thus, the first section of the study constitutes the analysis and interpretation of reference management software in the universities within Nairobi County. In contrast, the second section delves into findings on RMS effectiveness.

5.1 Reference management software in use

The first research question sought to establish which reference management software is used in the Universities in Nairobi County, Kenya. This sub-section presents the results regarding familiarity, brands used, usage frequency, proficiency levels, and user induction.

5.2 Respondents' familiarity with reference management software

Respondents were asked to rate their familiarity with respective RMS on a 5-point scale from 1=Never heard of it to 5=Very familiar. The mean rating for each RMS software product is ranked from the highest to the lowest, as shown in Figure 1.
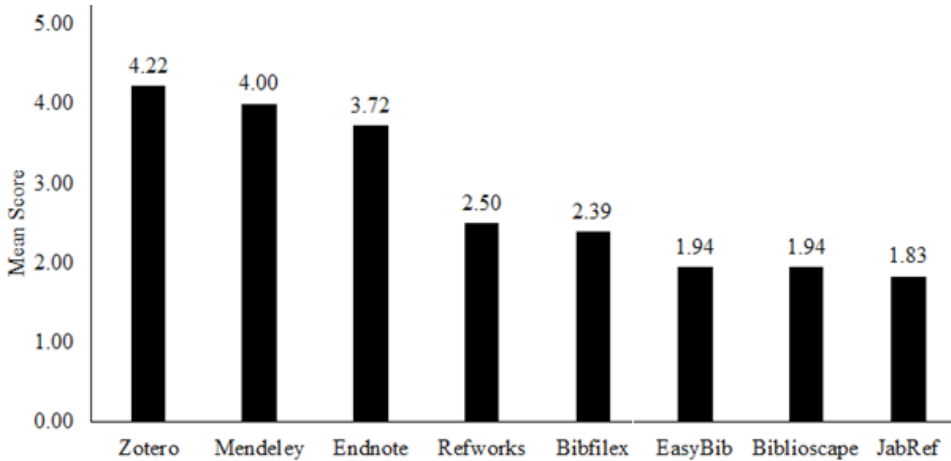
Figure 1: Familiarity rating of citation management software product

As shown in Figure 1, Zotero garnered the highest familiarity rating on a 5-point scale (μ=4.22), followed by Mendeley (μ=4.00), Endnote (μ=3.72), Refworks (μ=2.50), Bibfilex (μ=2.39), EasyBib (μ=1.94), Biblioscape (μ=1.94), and lastly, JabRef (μ=1.83).

5.3 Reference management software usage

Respondents were asked to indicate the Reference Management software brands they have used before. Figure 2 ranks the software brands in terms of popularity.
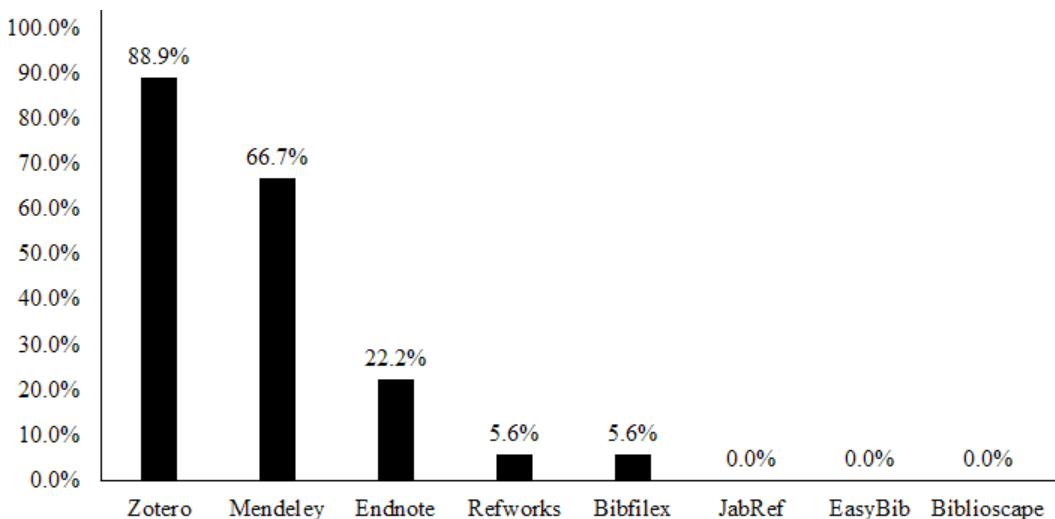
Figure 2: Reference management software usage

The results in Figure 2 indicate that the majority of the respondents had used Zotero (88.9%), followed by Mendeley (66.7%) and Endnote (22.2%). The figure reveals that Refworks (5.6%) and Bibfilex (5.6%) were the least used, while JabRef, EastBib, and Bibilioscope were used by 0.0% of the respondents.

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5.4 Reference management software usage frequency

Respondents were asked how often they utilise Referencing management software. Figure 3 presents the distribution of respondents by RMS usage frequency.
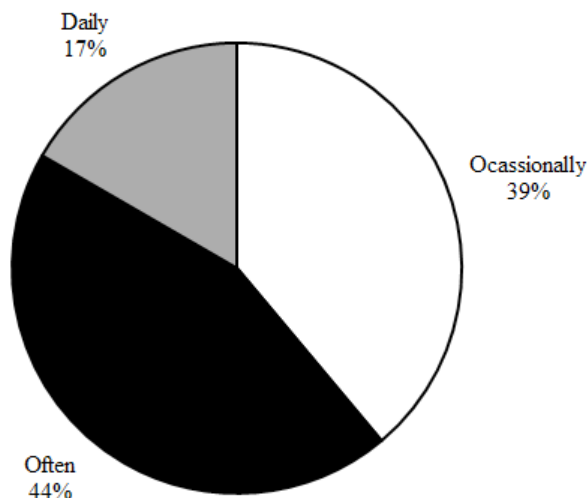
Figure 3: Reference management software usage frequency

Figure 3 indicates that 44% of the respondents often used RMS, 39% only used RMS occasionally, and 17% used RMS daily.

5.5 Referencing management software usage proficiency

Respondents were asked to indicate what proficiency levels they would say they possess in using RMS. Figure 4 displays how respondents were distributed.
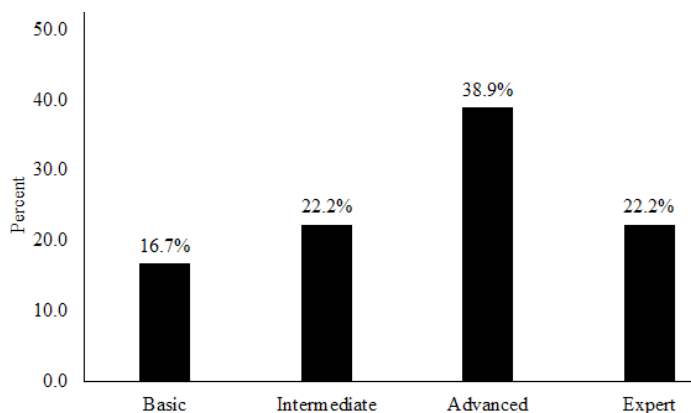
Figure 4: Referencing management software usage proficiency

Figure 4 indicates that advanced users were the majority (38.9%), followed by experts (22.2%) and users with intermediate skills (22.2%), while respondents with basic usage proficiency were 16.7%.

5.6 Induction on Use of Reference Management Software

The study sought to establish whether respondents were inducted on using RMS in their institution. Table 1 presents the findings.

Table 1: User Induction Rate

Have you received any induction on using reference management software from your institution?	Frequency	Per cent
Yes	18	100.0%
No	0	0.0%
Total	18	100.0%

Table 1 indicates that all (100%) respondents had been inducted to use RMS in their institution.

The second research question was: Are the reference management software in use technically, operationally, and economically effective in enhancing the quality of research output? This sub-section presents a descriptive analysis of the RMS effectiveness dimensions that were investigated.

5.7 Reference management software user perceptions

Figure 5 shows how respondents were distributed concerning various elements of user experiences.

Figure 5 shows that 100% of the respondents found the use of RMS necessary as an enhancement to research work, 88.9% of the respondents found RMS visually appealing, 77.8% of the respondents observed that the referencing application supported integration with other tools or platforms such as MS word and Google Docs, 66.7% of the respondents noted that all the necessary referencing styles were available in their RMS, 61.1% of the respondents found citation and references generation straight forward and error-free, 50% of the respondents reported that the library in their RMS can be shared across other brands. In comparison, only 16.7% of the respondents encountered hidden costs or unexpected charges associated with their referencing application.
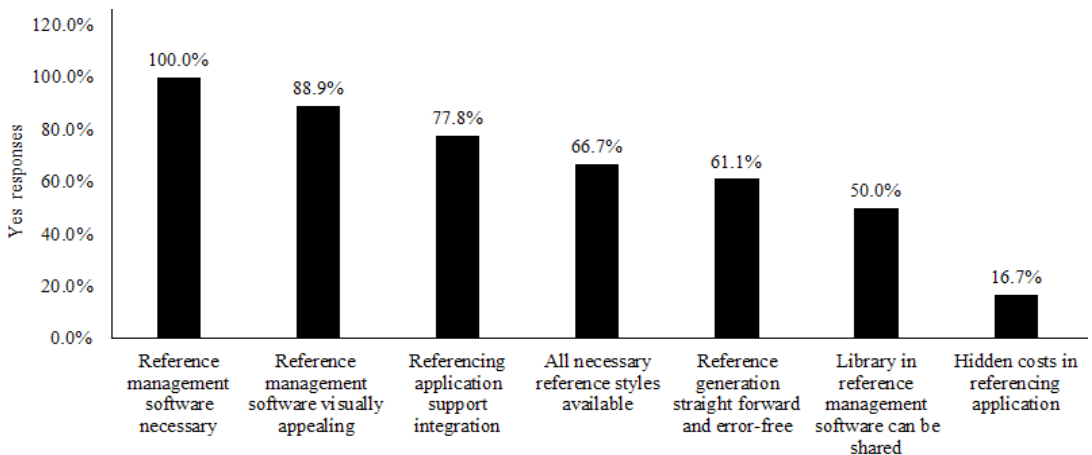
Figure 5 Reference management software user perceptions

5.8 Respondents' perception of ease of navigation

Respondents were asked to rate the ease of navigation within referencing applications they have used on a 5-point scale from very difficult to very easy. Figure 6 displays the findings.

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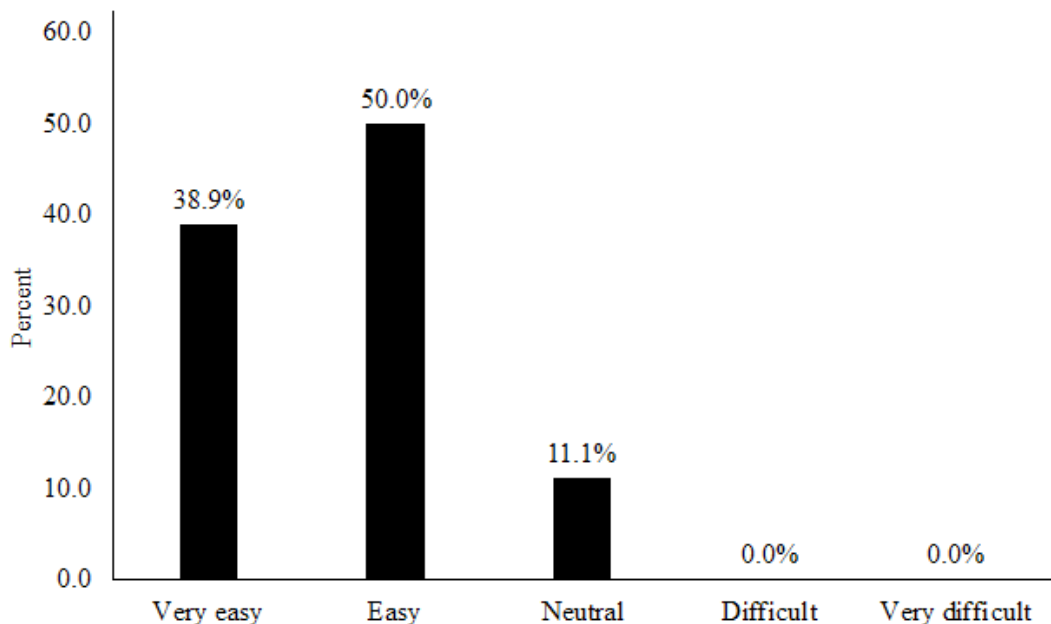
Figure 6: User rating of ease of navigation

As per the distribution in Figure 6, 50% of the respondents found RMS easy to navigate, and 38.9% reported that navigation was very easy. However, some 11.1% of the respondents were neutral, while no respondent reported difficulty with navigation.

5.9 User rating of automatic reference generation

Respondents were asked to rate their referencing tool's ability to automatically format/generate references and citations according to different styles (APA, MLA, Chicago) on a 4-point scale from 1 = poor to 4 = excellent.
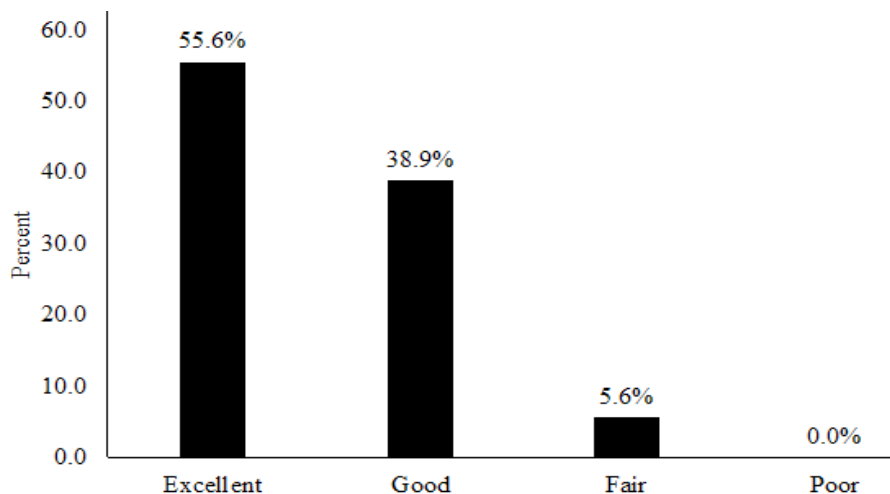
Figure 7: User rating of automatic reference generation

Figure 7 reveals that 55.6% of the respondents awarded their RMS an excellent rating, 38.9% rated the RMS as good, and 5.6% rated the RMS as fair. The figure indicates that no respondent rated the RMS as poor. The results suggest that the ability of RMS to automatically format/generate references and citations according to different styles was highly rated.

5.10 User rating of aspects of research sharing and collaboration

The study sought to establish how respondents rated various RMS on research sharing and collaboration on a 5-point scale from 1=doesn't support to 5=extensively support. The RMS brands are ranked in Figure 8 in terms of mean rating from the highest to the lowest.
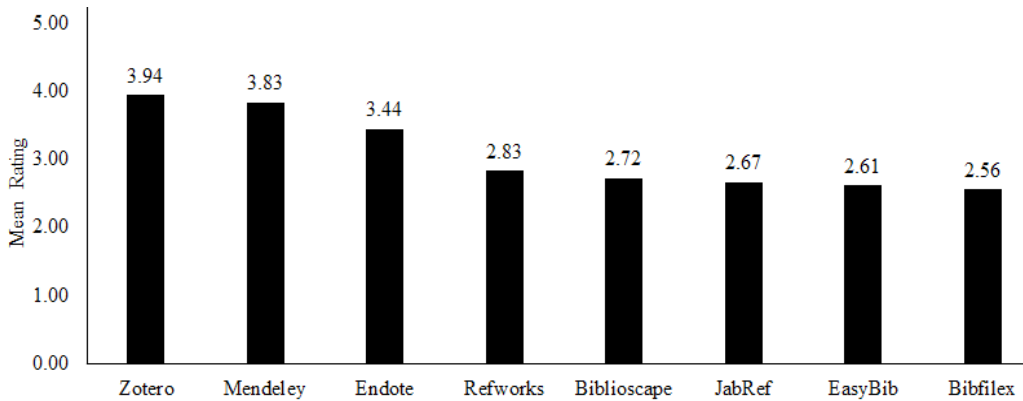
Figure 8: User rating of aspects of research sharing and collaboration

Figure 8 reveals that Zotero (μ=3.94) and Mendeley (μ=3.83) were the most highly rated RMS on a 5-point scale in terms of research sharing and collaboration, followed at a distance by Endnote (μ=3.44). The rest of the RMS garnered comparatively low ratings. These were in rank order: Refworks (μ=2.83), **Biblioscape** (μ=2.72), JabRef (μ=2.67), EasyBib (μ=2.61), and Bibfilex (μ=2.56).

5.11 Version of reference application used

Respondents were asked whether they used a free or paid version of RMS. Table 2 presents how respondents were distributed.

Table 2: Version of reference application

What version of the referencing application are you using?	Frequency	Per cent
Free version	18	100.0%
Paid version	0	0.0%
Not sure	0	0.0%
Total	18	100.0%

As per the result in Table 2, all (100%) respondents used the accessible version of RMS.

5.12 Return on investment in referencing application

Respondents were asked to rate the return on investment using referencing applications in light of time and cost savings. Table 3 indicates how respondents were distributed in terms of rating.

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Table 3: Rating of return on investment in using reference application

How would you rate the return on investment of using the referencing application, considering the time and the cost saving it provides?	Frequency	Per cent
Excellent	0	0.0%
Good	7	38.9%
Neutral	11	61.1%
Poor	0	0.0%
Very poor	0	0.0%
Total	18	100.0%

Table 3 indicates that the majority (61%) of the respondents were neutral on the question of how they would rate the return on investment of using the referencing application considering the time and cost saving it provides. This can be explained by the fact that all the respondents use free reference management software programs, which means an investment with no charges. Nonetheless, 38.9% of the respondents rated return on investment as good, while no respondent rated return on investment as poor.

5.13 Time efficiency of referencing application

Respondents were asked how the referencing application affected their time to complete their work or academic assignments. The responses are presented in Figure 9.
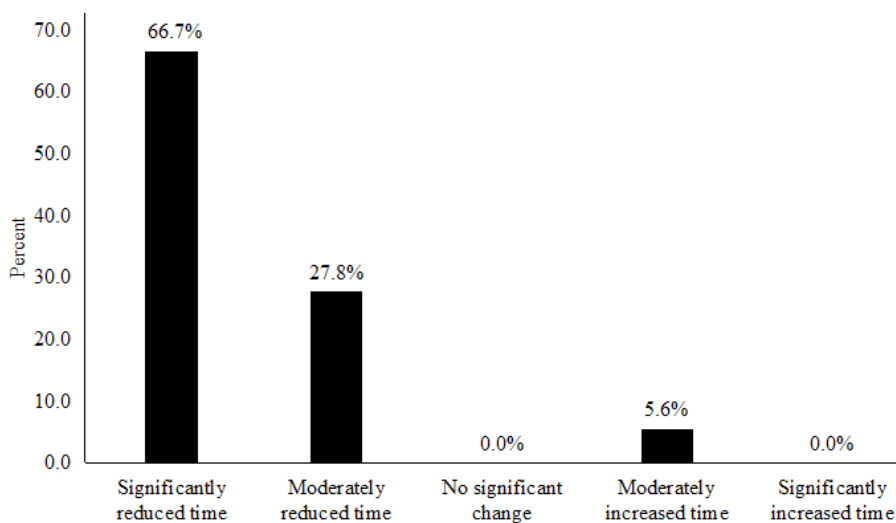
Figure 9: Perception of time efficiency of referencing application

Figure 9 reveals that 66.7% of the respondents said the referencing application significantly reduced the time, 27.8% said it moderately reduced the time, and 5.6% of the respondents said it moderately increased the time. This means that referencing software programs is time-efficient and operationally effective for research.

5.14 Views on alternative referencing applications

The study sought to establish whether respondents would consider adopting alternative referencing applications if they offered better economic value and whether, in their opinion, there are better ways of generating references and citations apart from the use of Reference Management Software. Figure 10 presents how respondents were distributed regarding their views on alternative referencing applications.
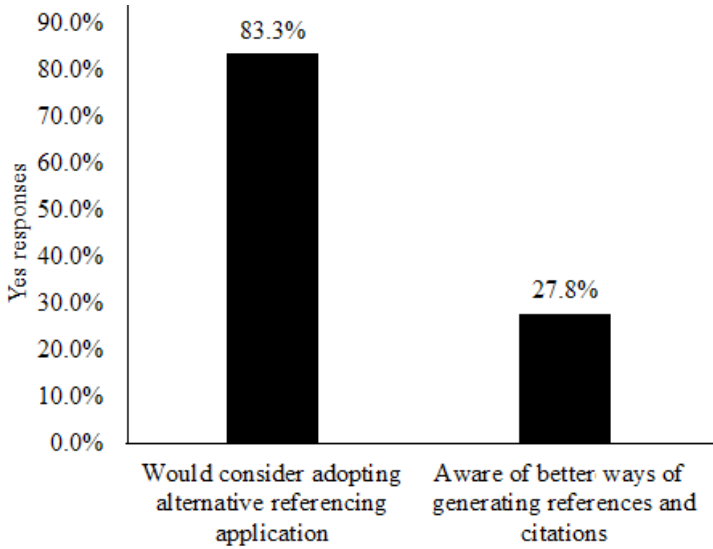
Figure 10: Views on alternative referencing applications

As per the results in Figure 10, 83.3% of the respondents indicated that they would consider adopting an alternative referencing application if it offered better economic value. However, only 27.8% of the respondents knew better ways of generating references and citations apart from using RMS. This indicates that most University Librarians within Nairobi County are ready and willing to explore additional reference management software-related innovations. The lack of awareness of better options means that newer options may not be known in the market. Hence, the ones in use are economically efficient for their current referencing and citation needs.

5.15 Rating of accessibility features

Respondents were asked to rate the accessibility of features within their referencing application on a 5-point scale from 1=very inaccessible to 5=very accessible. Figure 11 displays how the responses were distributed.
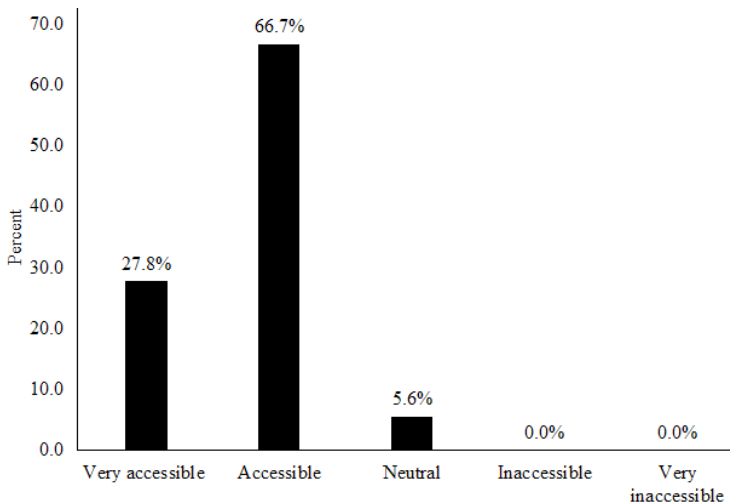
Figure 11: Rating of Accessibility Features

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As results in Figure 11 show, 66.7% of the respondents rated the features within the RMS they used as accessible, and a further 27.8% rated the same as very accessible. Some 5.6% of the respondents were neutral, but no respondents rated the features as inaccessible.

6 Discussion

The study established that a total of 60% of all the respondents are either at an advanced stage or expert stage in terms of usage proficiency (38.9% and 22.2%, respectively). This means that a larger number of university librarians have high self-efficacy levels when using the available reference management software programs. This means they were the ideal group of respondents to make comments on how effective they found these software programs. Zotero and Mendeley are highly favoured among respondents, with Zotero being the most widely used. Endnote also had significant but lower adoption.

Interestingly, Refworks and Bibfilex were the least utilised, and JabRef, EasyBib, and Biblioscape had no reported usage. These findings suggest a distinct preference for certain RMS brands among university librarians in Nairobi County. These results differ from Speare's (2018) observations at the University of Manitoba, where Mendeley, EndNote, Zotero, and RefWorks were popular among students. Zotero and Mendeley were given higher ratings regarding their ability to collaborate and share bibliographic description libraries. This means they are the best built to handle regional research collaboration technically. It also diverges from the results of Panda (2023), whose research reported that Google trends placed Mendeley as the most in demand. The disparities highlight potential regional or institutional variations in RMS preferences, underlining the importance of localised studies to comprehend the unique factors influencing RMS usage patterns in different contexts. The study also revealed that many respondents reported that their preferred reference management software programs have accessible features. 27.8% of the respondents said the features are very accessible, while 66.7% of the same respondents said the software features are accessible. Any software program with its features accessible to a significant percentage of its users is technically effective.

The unanimous agreement among respondents on the necessity of RMS for enhancing research work is consistent with the literature. Madhuri and Lakshmi's (2021) research in India found that 35% of library and information science researchers use RMS for editing and formatting references, which supports the idea that these tools are essential for efficient reference management. Further, the relatively low percentage of respondents encountering hidden costs or unexpected charges aligns with Fenner et al.'s (2014) observation that the process has been made comparatively cheaper with the inception of citation management software programs. It is instructive to note that all the respondents in this study used the accessible version of RMS, further signalling the absence of direct cost implications of RMS usage, indicating that these reference management software programs commonly used within Nairobi County are economically effective for research.

The study findings, where one in every two respondents found RMS easy to navigate and an additional 38.9% reported very easy navigation without any respondents indicating difficulty, align well with literature emphasising the time-consuming nature of manual reference management and the subsequent improvement brought by reference management software. In this research, 66.7% of the respondents mentioned that reference management software programs significantly reduce the time taken in referencing and citation tasks. Respondents overwhelmingly noted a significant reduction in the time required for their work, aligning with the literature's emphasis on the essential role of RMS in generating accurate citations and references to streamline the writing process (Basak, 2014). Additionally, the survey's acknowledgement of time reduction is consistent with Farag's (2019) argument that referencing tools become crucial in the research process due to the significant time savings they offer researchers, particularly in tasks involving generating and organising references and in-text citations. This firmly brings out the aspect of operational effectiveness since the software is easy to use, saves time, and rightly supports operations for an effectual output.

The literature by Fenner et al. (2014) highlights the transformative impact of such tools, making the process easier. Moreover, the positive responses on ease of navigation correspond with the broader literature, specifically Farag (2019) and Basak (2016), which stress the crucial roles of perceived ease of use in influencing RMS usage.

The study revealed that respondents highly valued the ability of their RMS to automatically format and generate references and citations in different styles, with the majority giving an excellent rating and none rating it as poor. This indicates technical effectiveness, the capacity of an aspect to produce maximum output from minimum input. This positive assessment aligns with the literature emphasising the efficiency gains of citation management software. Rempel and Mellinger (2015) noted that using these tools speeds up research due to their inbuilt library components, saving bibliographic descriptions for future reference. Additionally, Madhuri and Lakshmi (2021) highlighted that researchers prefer RMS for its capacity to enhance the formatting and editing of references according to specific citation styles.

The study's results indicate that Zotero and Mendeley received the highest ratings for research sharing and collaboration, with Endnote following at a distance. This aligns with the literature's emphasis on the essential role of referencing tools in research. Farag (2019) notes that scholars prefer these tools due to their time-saving capabilities and capacity to enhance the storage and sharing of bibliographic information. University lecturers, professors, and field practitioners value networking and sharing bibliographical information. This may explain the higher ratings for research sharing and collaboration in the study.

7 Conclusion

In conclusion, the study has indicated that the reference management software programs preferred in Universities based within Nairobi County, Kenya, are technically, financially and operationally effective at enhancing research quality. The study also indicated that specific RMS tools are highly valued and widely used among university librarians in Nairobi, Kenya. University librarians express high satisfaction and proficiency in utilising these tools, with notable strengths in automatic formatting, ease of navigation, significant time reduction and collaborative capabilities. However, there is an opportunity for increased awareness and education about alternative referencing approaches, and the universal use of free versions suggests a potential willingness to explore cost-effective options.

8 Recommendations

- It is recommended that universities undertake continuous institutional training programs for librarians and researchers on practical usage of RMS (16.7% have a basic level of proficiency, while 22.2% of the same respondents are at an intermediate level). Training sessions should cover basic and advanced functionalities, catering to different levels of proficiency among librarians. This would enhance their proficiency levels, which in turn will empower them in their role to enhance research and impart patrons, especially in relation to referencing and citation.
- Additionally, librarians should be sensitised to additional reference management software programs to raise awareness levels for Jabref, Easybib, Biblioscape, and any other reference management software programs that may enhance research by generating accurate references and citations and research collaborations through sharing bibliographic collection libraries.
- Through consistent information literacy training sessions, librarians should mentor knowledge ambassadors in the capacity of faculty and student researchers in universities, who can promote the collaborative use of RMS tools within and across universities to enhance research sharing and collaboration. They should establish platforms or forums where researchers can share best practices and collaborate on RMS-related initiatives. Further, librarians should develop communication strategies to raise awareness among fellow librarians and researchers about alternative reference

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and citation management approaches. This could involve disseminating information through workshops and conferences. As a further research direction, this study should be extended to all public universities in Kenya for comparison purposes.

- Further research and innovation may be done to establish new ideas that may be adopted for referencing and citation. The research revealed that university librarians are very receptive and open to new ideas on referencing and citation at a very high rate (83%) but aren't aware of any new ones apart from the use of reference management software. New ideas and innovations in reference and citation management would, therefore, find a receptive environment, and the uptake would be high.

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LIS EDUCATION AND TRAINING IN A DIGITAL ERA

19. Framework for Knowledge Management Curriculum in Africa

Joseph Kiplang'at*; Elisam Magara*
*Africa International University, Kenya
joseph.kiplang'at@africainternational.edu

**Makerere University, Uganda
elisam.magara@gmail.com

Abstract

This paper is based on a study that assessed the Information and Knowledge Management curriculum in selected African universities to identify convergence and possible gaps. The study assessed the parameters not limited to the need and justification of the programmes, the rationale and purpose of the programmes, the curriculum outcomes, and the career opportunities. Further, the paper analysed the content structure and delivery mode and identified a cluster of courses emphasising professional interest and occupational linkages. A review of relevant literature informed the study on the trends in implementing the KM curriculum. A review of universities' websites was done to identify universities that offer Information and Knowledge Management curricula. Knowledge management learning theories underpinned the study. It adopted a phenomenological research design to enable an understanding of the epistemological concerns in determining the nature of knowledge management. A structured online questionnaire was designed and distributed to 15 universities in Africa, and responses were obtained from 9 of them. The findings indicate that knowledge management programmes were developed in the context of national goals, global Sustainable Development Goals, development plans and the occupational needs of the information and knowledge industry. There were significant similarities in the curriculum offered in the respective universities. For example, the occupational professional skills and competencies exhibited by the curricula prepared the learners to work as knowledge managers/practitioners in the industry. The parameters and justification of the KM programmes follow the Trait theory. The study has proposed a framework to guide the development and implementation of the KM curriculum in Africa.

1 Introduction

Information and Knowledge Management (KM) should be an integral part of the Sustainable Development Goals (SDGs) of any nation. The past decade has witnessed explosive growth in knowledge and knowledge management research for Sustainable Development Goals. Knowledge Management has become a critical theme in many large business meetings and conferences. Knowledge generated within the universities and research institutes is expected to be applied in health, agriculture, transport, information and communication technology (ICT) sectors.

Adopting emerging technologies in the 4th and 5th Industrial Revolutions (IR) has enhanced the deployment of information and knowledge management systems. The 4th and 5th Industrial Revolution (4IR/5IR) is a broad term characterised by a fusion of technologies and integration of robotics, artificial intelligence (AI), big data, nanotechnology, quantum computing, Internet of Things, and 3D printing, among others. The 4IR/5IR is an Internet of Things and services where resources, information, objects, and people are linked for value creation. The technology-centred approach in KM focuses on installing and using knowledge-oriented software and artificial intelligence systems (Wilson, 2002). This approach has at least four vital components, namely the availability of knowledge systems, networks, knowledge works, and learning organisation. All these demonstrate the commitment to creating new knowledge, disseminating it throughout the organisation and embodying it in the products, services and systems.

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Information and knowledge play a catalytic role in a country's industrial, economic, and social development. Strengthening information and knowledge management capacity can help a country achieve the highest socio-economic benefits. As new technologies emerge, new ways and techniques of managing information are required to support development needs. Thus, the capacity to train, conduct research, and use knowledge across societies is one strategy that would foster industrial and socio-economic development.

Knowledge societies have two broad objectives: social transformation and wealth generation. Social transformation through education, health care, agriculture and governance creates opportunities for employment generation, high industrial growth, a transparent society, and rural prosperity. These objectives are influenced by several forces, such as economic, social, political, global, and technological developments. On the other hand, wealth generation pillars such as energy, conventional ecology, mineral resources, telemedicine, native knowledge products and the services sector create opportunities for knowledge-based products, technologies, values, and processes (Rowley & Hartley, 2008) needed for transformation of the society. Transform society requires knowledge systems that enable ease of retrieval and tools for sharing knowledge to ensure its application and use to solve society's problems and enhance innovativeness.

The African Agenda 2063 aims at providing internal coherence and coordination to continental, regional and national frameworks and plans adopted by the African Union, regional economic integrations, member states' plans and institutional strategies. Thus, increasing recognition of the value of knowledge and information to individuals, organisations and communities requires proper identification, location, interpretation, and use of information and knowledge.

Globally, many universities have developed and implemented knowledge management programmes to address the national goals, global sustainable development goals, development plans and occupational needs of the information and knowledge industry. In Africa, several universities have launched KM programmes, including International Management University, Namibia; Stellenbosch University and the University of South Africa in South Africa; KCA University Kenya and the Technical University of Kenya, in Kenya, among others. In addition, most universities offering information science programmes offer KM as either an option or a core course. As Africa is moving towards globalisation to cope with the dynamic world, it is essential to assess how universities are best adopting the KM curriculum. Disruptive technologies may positively affect the deployment of ICT to support knowledge-sharing strategies.

As universities and colleges prepare for future interactive learning, they must incorporate KM and new technologies, such as virtual and augmented reality, artificial intelligence, and big data analytics, into their curricula and teaching methods. This will enable universities to create more immersive and engaging learning experiences for their students. Deployment of 4IR/5IR technologies enhances student experience by providing access to personalised and tailored educational services, such as online tutoring, virtual internships, and career guidance through AI.

2 Statement of the problem

Many universities globally have instituted programmes based on society's needs, and some organisations recognise the value of knowledge management and the relevance of knowledge capture in their businesses. However, the key obstacles associated with knowledge management in organisations and societies are a lack of effective knowledge-sharing tools, a lack of a conducive environment for knowledge sharing, and difficulty sharing knowledge across disciplines and domains. The challenge emanates from the training being offered and how content is structured.

Knowledge management acquisition, sharing and utilisation may benefit society if universities adopt KM learning models such as experimental, adoptive, assimilation, blooms, and the Japanese models. Further,

professional practice, interests and goals and KM content that provide substantial theoretical and practical knowledge should be considered. The learning outcomes, objectives, and occupational opportunities should be clearly stated. The challenge for African universities is contextualising their KM programmes to address the needs of organisations and institutions. This study proposes a framework to guide the development and implementation of KM curriculum review in Africa.

This paper aimed to assess the Information and Knowledge Management curriculum in selected African universities to identify convergence and gaps. The specific objectives that guided this study were to:

- Explore the kind of curriculum being implemented in respective universities in Africa and assess the occupational and professional skills and competencies exhibited by the curricula.
- Examine the parameters, including, but not limited to, the programme's need and justification, rationale and purpose, curriculum outcomes, and career opportunities.
- Analyse the structured content, identify a cluster of courses given professional interest and occupational linkages, and identify areas of convergence and gaps in KM curricula.
- Propose a framework to guide the development of a knowledge management curriculum in Africa.

3 Knowledge management learning theories

Curriculum review and development should integrate aspects of the academic discipline of the study and a professional field of practice, which creates a need to rely on theoretical or conceptual models of knowledge management (Rubin, 2004; Dalkir, 2005). In Trait theory, professions are accepted or rejected based on whether they possess certain traits (Rubin, 2004). Some of these considerations is a substantial body of theoretical knowledge that forms the intellectual foundation of the profession (organised body of knowledge through formal education, whether it permits a substantial amount of autonomy at the professional judgement and with bounds of canons of their profession and are free to act per judgements). Further considerations are the conduct of its practitioners through licencing and a code of ethics given by authority to control entrance into the profession and sanction practitioners. One significant trait of interest that requires a guide is the possession of a substantial body of theoretical and practical knowledge that forms the intellectual foundation of the profession through an organised body of knowledge.

Professions such as law, medicine, nursing, teaching, and librarianship arose in contrast to many other factory-oriented occupations of the period. The central value service, monopoly over the practice of the profession and professional identity, such as the ability to define and enforce the standards, requires a clear delineation of knowledge and knowledge management as guided by the KM learning theories.

Dalkir (2011) summarises knowledge management as strategies, tools, and techniques, including storytelling, peer-to-peer mentoring, and learning from mistakes (all have precedents in education, training, and artificial intelligence practices). The multidisciplinary nature of KM draws upon a vast number of diverse fields such as organisational science, cognitive science, linguistics and computational linguistics, information technologies such as knowledge-based systems, document and information management, electronic performance support systems, and database technologies, information and library science, technical writing and journalism, anthropology and sociology, education and training, and storytelling and communication studies. KM is also associated with collaborative technologies such as Computer-Supported Collaborative Work (CSCW) and groupware, intranets, extranets, portals, and other web technologies. The multidisciplinary nature of the KM discipline represents a foundation upon which to base an understanding and its practice. Managing such an environment to support organisations, societies, and individuals requires the availability of highly trained and skilled human resources, which would require building capacity based on learning modes and KM theories to guide them.

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Various efforts have been made to guide the conceptual development of knowledge management (KM) systems. Rademacher (2011) applies Bloom's Taxonomy of Cognitive and Greenwood's Six C's of the Knowledge Supply Chain to elaborate on knowledge management. Whereas Bloom's model uses six cognitive levels (knowledge, comprehension, application, analysis, synthesis, and evaluation), Greenwood's model uses six supply chain criteria (create, clarify, classify, communicate, comprehend, and group create). For example, in knowledge socialisation (tacit to explicit), besides creating capabilities through document management systems, there is the ability to convert the tacit issues underlying the creation into explicit form. Leavitt (2011) provides guided three organisational learning theories: 1) the experiential learning theory from the "cognitive" school; 2) the adaptive and generative learning theory, also from the "cognitive" school; and 3) the assimilation theory from the "behavioural" school. Whereas experiential learning theory (ELT) is based on psychology, philosophy, and physiology, it has significantly influenced leadership and organisation development and contributed to the principles of learning organisations. Its basic premise is that learning occurs through grasping and transforming experience. On the one hand, the adaptive and generative learning theory is deeply ingrained in assumptions, generalisations, or pictures and images that influence how we understand the world by focusing on the foundation of existing knowledge and amending that with new thinking to accomplish an objective. On the other hand, the Assimilation Theory, which is different from the cognitive theories, behavioural approaches to organisational learning emphasise the action-based changes that occur as individuals learn through performance, ranging from knowledge acquisition and knowledge sharing to knowledge utilisation.

From the above, three key features provide a primary criterion for curriculum development: the learning process (how learning occurs within an organisation), the learning target (who experiences the learning – individuals, groups, and/or organisations) and the learning context (antecedents and conditions that promote organisational learning). To design a learning process, the most crucial consideration is the knowledge source (internally or acquired externally), product-process focus (organisation produces versus how it develops and delivers its products/services), documentation mode (individual possession of knowledge versus its public availability; dissemination mode (sharing learning through formal, organisation-wide methods versus informal methods); the learning focus (incremental versus transformative learning); 6) value-chain focus: ("design functions versus "market and deliver" functions) and 7) skill development focus (development of individuals' versus teams' skills).

How learning occurs is motivated by a wheel of learning—the four-step process: reflecting, connecting, thinking, and acting and the three-step process of knowledge acquisition, sharing and utilisation. To integrate the KM as a practice in the wheel, models such as the resource, Japanese, and process models come into play. For example, the Japanese model– created by I. Nonaka and H. Takeuchi in the early 1990s indicates two kinds of knowledge: silent (hidden) and formal (available) (Spahic et al., 2014). Silent knowledge is the most critical part of the organisation's success, and sharing it depends on its success. According to Japanese researchers, knowledge management is based on a "spiral" as a cycle of four knowledge conversion processes—the transformation of hidden knowledge to formal knowledge.

In contrast, the Process model is based on practical experiences that enable the creation, dissemination, and use of knowledge to achieve organisational objectives. This knowledge goes through a value chain through several processes: Knowledge acquisition, storage, dissemination, and application. To develop those skills, the curriculum is needed to handle the technological management of information and the construction of information management systems. This can only be achieved by managing people primarily involved in assessing, changing, and improving human individual's skills and/or behaviour.

4 Research methodology

This study adopted a phenomenological research design to enable an understanding of the epistemological concerns in determining the *nature* of knowledge management. The priori knowledge to this study was needed on the kind of universities that offer KM programmes, curriculum expectations, and certain fundamental principles of curriculum reason and logic. The study started with a conception of the need to develop a programme that suits higher education in African universities. A discussion was held with the authors of this paper, and informal consultations were held with the graduate school at Africa International University to obtain a summary of the programmes offered at the university.

A review of the status of KM curricula outside Africa was done to provide insight into trends in KM curricula. Based on previous knowledge, three universities (Nanyang Technological University Singapore, Kent State University, and University of Maryland) were reviewed. These universities were purposively identified as offering Knowledge management programmes.

A reconnaissance of African universities offering KM programmes was identified to inform the study's instrument. These include the International University of Management, Namibia, Stellenbosch University, University of South Africa, KCA University, Kenya, and The Technical University-Kenya. The identification of the universities was based on previous knowledge of the programmes and available contact respondents. The information obtained therein formed the design of an instrument of study. Three main areas included in the instruments were: What kind of KM curriculum is offered? What is the content of KM curricula? What is the proposed strategic direction of the programme? The instrument was distributed to 15 African universities offering KM as a programme and course unit. The universities that responded included Kyambogo University, Makerere University, and Kabale University from Uganda. In Kenya, four institutions responded: Kenyatta University, Moi University, Maasai Mara University, Karatina University, University of South Africa, and University of Zululand. In addition, for some universities that never responded, websites were accessed to access basic information on the programmes offered.

5 Interpretation and discussion of findings

Like any other discipline, a knowledge management curriculum is designed based on criteria set by the global agenda, regional commitment, and national curriculum development guidelines to meet societal, professional, and academic needs. The African Union has set the year 2024 as a year of education—the goal of the Continental Education Strategy for Africa (CESA), Sustainable Development Goal 4, with a focus on balancing skills produced by universities and those required in their regional economies (Sawahel, 2024). As the Inter-University Council for East Africa (2010) advises, the challenge of any higher education is to achieve the goals, objectives, and outcomes effectively and efficiently to reflect stakeholders' requirements. A review of the national bodies responsible for quality assurance in African higher education indicates some standard parameters of what is expected of a university programme. At a macro level, the programme developed is influenced by the learning process, the target and the context. Thus, the curriculum should facilitate a balanced learning process and ensure that students can acquire cognitive, effective, and psychomotor skills consistent with educational goals and aspirations defined by the national body. For example, the Uganda NCHE specifies that the curriculum should ensure that the programme is broad-based or integrated, practical-oriented, diversified, does not compromise standards, and contributes to national objectives. The goal, learning outcome, target requirements and significance level justify the programme's running. A key attention to a substantial body of theoretical, practical, and diversified knowledge is paramount. The first specific objective of the survey was to explore the kind of KM curriculum being implemented in respective African universities. To assess this, the parameters considered include the objective and outcomes, justification, KM content, prospective career growth and employment.

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5.1 Name of the programme

Most of the programmes offered in Knowledge Management are at the Master's level. The names vary depending on the university. At the International University of Management (IUM), Namibia, a Postgraduate Diploma in Knowledge Management (Level 8) grants admission to a Master of Science in Knowledge Management Level 9 or any related qualification at NQF Level 9. The Postgraduate Diploma in Knowledge Management Sciences takes a minimum of one year full-time or a maximum of three years to complete. At Stellenbosch University, a Master of Philosophy in Information and Knowledge Management is offered by the Faculty of Arts and Social Sciences, a one-year programme comprising a research project in the management of, leadership in and strategic development of knowledge-intensive organisations. It is taken by holders of a Postgraduate Diploma in Knowledge and Information Systems Management with at least 65%. Stellenbosch University assesses a thesis according to the university's regulations. At the Technical University of Kenya, the programme is Master of Information and Knowledge Management. Jomo Kenyatta University of Agriculture and Technology offers an MSc in Information and Knowledge Management, while the KCA University offers a Master of Science in Knowledge Management and Innovation). At the KCA University, Kenya, the KM programme is open for professionals in all disciplines who seek to effectively manage organisational knowledge within their specialised field and drive strategic innovation and collaboration. Some other universities offer knowledge management, such as information management and information science. Those who did not offer knowledge management as a programme offered it as a core course unit, especially in the Master of Science in Library and Information Studies and Masters of Science in Records and Archives Management programmes. Even those who offered complete programmes in KM had other courses in other programmes in records management and library and information science. For example, Makerere University offers a course on Knowledge Management and Organization and Organization of Knowledge, which constitute the core courses of KM content.

The discipline's orientation defines the issue of the programme's name as an art, a science or a general programme. At Nanyang Technological University (NTU), Singapore and Kent State University (KSU), it is an MSc in Knowledge Management (KM). At the same time, at the University of Maryland, it is referred to as a Master of Information Management (MIM). As a discipline, KM promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing an enterprise's information. NTU promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously uncaptured expertise, experience, and social networks in individual workers. At KSU, the core is transforming information and intellectual assets into enduring value for an organisation's clients and people. The programme's goal guides what is to be achieved with these programmes.

5.2 KM curriculum goal and purpose

The curriculum goals vary with universities depending on orientations, national priorities, and justification or significance. The universities studied the major goals of equipping learners with knowledge and skills to manage knowledge in different formats and effectively prepare students to manage organisations' intellectual and knowledge-based assets. Learners should be able to identify, create, store, share and deploy knowledge in an institution to maximise its competitive advantage from its intellectual assets. To address the strong global consensus that knowledge is a crucial driver of socio-economic development and the gap that countries have not actively embraced this new way of decision-making, the IUM has set objectives to produce well-qualified individuals with knowledge balanced between science, management, and policy, and provide a scientific understanding of knowledge management, applicable to sustainable development and policy-making context. In Kenya, the Technical University of Kenya specifies that the purpose of the programmes is to prepare trainees to establish and manage information and knowledge centres; discover and manage tacit, explicit (recorded), and embedded knowledge through information and knowledge audits, appraisals and mapping;

apply information and communication technologies in information and knowledge management; develop and implement information and knowledge management strategies; design, develop and market information and knowledge products; and formulate and implement information and knowledge policies.

From the above, we see that the goal addresses issues of knowledge, skills to manage KM in different formats, information management to identify, create, store, share and deploy balancing between science, management and policy and observing a variety of knowledge assets. According to the Trait theory, the curriculum is designed to address objectives that possess a substantial body of theoretical knowledge, an organised body of knowledge with substantial autonomy and monopoly over the practice, and the ability for substantial authority to control the professional identity and enforce the standards (Rubin, 2004). One primary trait of interest that requires a guide is the possession of a substantial body of theoretical and practical knowledge that forms the intellectual foundation of the profession through an organised body of knowledge. This trend is not far from the rest of the world. Production of well-qualified individuals, fostering the reuse of intellectual capital, enabling better decision-making, creating the conditions for innovation and preparing learners to become strategic leaders in using information and technology in any organisation are core components of a curriculum goal. In both KST and Maryland, the Master's programme provides people, processes, and technology to help knowledge flow to the right people at the right time to act more efficiently, effectively, and creatively, thus providing learners with the skills and knowledge to meet users' information needs. It requires the development of information management capacities, the ability to deploy emerging technologies, and expertise in data analytics, visualisation, information strategy and governance. Cybersecurity and cyber-threat intelligence are at the core. Such programmes require the development of learners in sharing, innovating, reusing, collaborating, and learning, and they are expected to use a holistic approach in curriculum design.

5.3 KM curriculum learning outcomes

The curriculum designed for any programme and institution can only meet its intended objectives if it clearly articulates the learning outcomes. Below, we map observed outcomes from different universities with the six cognitive levels of Bloom's Taxonomy to the target (learners): knowledge, comprehension, application, analysis, synthesis, and evaluation. Table 1 gives details.

Table 1: Expected learning outcomes

Cognitive levels	Example of the Learning Outcomes
Knowledge	• Explain the concepts, components, and principles of information and knowledge management.
	• Identifying, collecting, and processing knowledge for use
Comprehension	• Explore how knowledge and information resources can be leveraged in information and knowledge organisations to have a competitive advantage.
Application	• Apply ethics in information management and apply various methods and strategies for the acquisition, capture, and organisation.
	• Share, use and reuse of knowledge.
	• Develop and apply information and communication technologies in knowledge management and demonstrate leadership in decision-making to ensure a competitive advantage for institutional success.
	• Provide leadership in digitalising information flows and knowledge processes; drive the national transformation into inclusive knowledge societies and contribute to sustainable development.

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Cognitive levels	Example of the Learning Outcomes
Analysis	• Enable learners to use information and communication technologies (ICTs) to manage organisational information and knowledge.
	• Audit organisational information and knowledge and prepare information professionals to have a client-centred perspective.
	• Design and adapt information products and services that are responsive to user needs
Synthesis	• Create customer value based on knowledge leadership, access the right knowledge available at the right time, and facilitate the creation of knowledge networks.
	• Develop the ability to create, preserve, retain, and organise knowledge for organisational success.
	• Develop the ability to provide professional education for a wide variety of service and management careers in libraries, information agencies, the information industry, and business environments,
	• Equipped with the requisite skills and competencies to contribute to society's social and economic growth.
	• Develop industrial-based learning to sharpen the skills and create the competencies the graduate will require for optimal duty discharge.
Evaluation	• Select entrepreneurial, management, and critical thinking skills for innovation, job creation, and project sustainability to explain the implementation of knowledge management systems.
	• Develop the ability to use knowledge management to create channels like intranets and portals and conduct cutting-edge research to address institutional problems emanating from poor management of knowledge-based assets.
	• Demonstrate understanding of how to select appropriate knowledge management solutions.
	• Demonstrate mastery in knowledge management practices, tools application, critical theories of KM and policy and strategy formulation for a KM system.

Generally, many of the above learning outcomes are exhibited in the higher level of brooms taxonomy at the application, analysis, synthesis, and evaluation, including analytical skills, narrative, emotional, and social intelligence, demonstrating the ability to provide leadership and mastery in the field of knowledge management practices, tools and applications. Most of the KM programmes reviewed outside Africa exhibit the ability to create customer value and impact-bearing provision of knowledge products and services, facilitate the creation of knowledge networks, unleash knowledge and experiences and enable creativity of intercultural, international and environmental consciousness. In addition, learners from such KM programmes should demonstrate the ability to assist organisations in forming information policies, developing and applying information systems and services, and using information management technologies and methods. For instance, in Maryland, the programme expects to develop learners' information management capabilities to deploy and manage emerging technologies, develop applications of information systems and services, and use information management technologies and methods.

5.4 Key attribute and entry requirement

Most Master's degrees require a minimum of a Bachelor's degree as an entry requirement, with some significant differences in specific knowledge and skills competencies. At IUM, Namibia, specific disciplines are accepted, including social sciences and humanities, science, media and library and information studies, and human resources. At Jomo Kenyatta University of Agriculture and Technology, the MSc in Information and Knowledge Management requires a minimum of honours plus three years of relevant experience or a Bachelor's degree with a pass plus at least five years of relevant postgraduate experience. The Technical University of Kenya requires at least a Second Class Honours (Upper Division) degree of TU-K in the relevant field or equivalent from a university recognised by the Senate of TU-K or a holder of a Second Class Honours (Lower Division) in the relevant field, or equivalent from another university recognised

by Senate with either at least two (2) years of relevant experience or a relevant postgraduate diploma/ certificate and one (1) year of relevant work experience.

Relevant experience with additional qualifications for the minimum requirements seems to be essential entry requirements for a Master's in Knowledge Management. In the knowledge socialisation (tacit to explicit), Leavitt (2011) contends that in adopting organisational learning theories: Experiential "cognitive, adaptive and generative or assimilation behavioural", consideration of the learning target (who experiences the learning – individuals, groups, and/or organisations become a major consideration in the design. This is the trend elsewhere in the world. In KSU, for example, applicants must provide recent professional achievements that indicate an ability to perform at a higher academic level to be considered for conditional admission to the programme. This is in addition to possessing appropriate technology and computer literacy skills, meeting the School of Information computer competencies, and meeting its minimum computer hardware, software, and Internet access requirements before the first day of class. This makes computer and information technologies a core requirement for a KM programme. The applicants who do not meet the minimum 2.750 GPA requirement must submit a statement that addresses the circumstances that contributed to the GPA and preparation for success in graduate study. At Nanyang Technological University (NTU), Singapore, preference is given to applicants with management or corporate experience in a public or private organisation, with at least a minimum of one year of full-time working experience, excluding internships.

5.5 The mode of delivery

Most of the KM programmes implemented were based on hybrid (physical and online), with only one institution offering online programmes. The programme structure was based on coursework with research (dissertation/project on which the student must submit a dissertation). At KCA University, Kenya, for instance, the programme is two (2) years. The mode of study is full-time plus weekend and part-time to take advantage of intellectual capital and knowledge assets for organisational success, where it builds the organisation's capacity for survival and profitability by developing, organising, retaining, and utilising human and knowledge resources. Most programmes had extended coursework with a project/balanced mix of core courses with electives. At IUM, Namibia, the blended learning approach for a study period for the qualification is a minimum of 1 year (full-time/part-time/block mode) and a maximum of 3 years. The mode of delivery is a crucial feature which directs the learning process, the learning target and the learning context (conditions that promote organisational learning) as recommended by Leavitt (2011), who guided three organisational learning theories: 1) the experiential learning theory from the "cognitive" school; 2) adaptive and generative learning theory, also from the "cognitive" school; and 3) assimilation theory from the "behavioural" school. To him, to design a learning process, the most crucial consideration is the knowledge source (internally or acquired externally), product-process focus (how it develops and delivers services), and documentation mode in terms of sharing learning and learning methods). Therefore, a multidisciplinary approach is applied in the delivery of this programme, with the focus being on management, technology, and innovation. This includes lectures, online tutorials, advanced simulations, video and audio-conferencing technologies and real-time practical, experiential learning, e.g. case studies, national and international conferences. Students must have access to a computer and the Internet.

The methods adapted for the programme are student-centred. Emphasis is placed on the need for students to read and research extensively in each course. In most programmes, the teaching mode for individual courses includes lectures, laboratory tasks, extensive use of case studies, tutorials, self-study, and field attachment. The assessment items include a variety of methods, such as examinations, coursework, laboratory work, and group projects.

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5.6 Nature of the programme

The nature of the KM programme depends on the country's overall curriculum framework and university guidelines. There are three plans: Course Work and Research (Dissertation), research Only (Thesis), Extended Course Work and Project, and a Masters Philosophy program. At Stellenbosch University, for example, a one-year Master of Philosophy in Information and knowledge management programme may be pursued by those who have passed the Postgraduate Diploma in Knowledge and Information Systems Management with at least 65%. The Master's is based on a project on which the student must submit a dissertation. To pursue a dissertation, students require a cumulative grade point average (CGPA) of 4.00 and above, in which case students may require additional semesters for completion of their project, two core courses, at least 4 Group A electives, 3 Group B electives and Critical Inquiry (group project). At IUM, Namibia, a candidate may apply for a full-time or part-time programme. To be awarded a degree, students must complete their programme requirements within their candidature period.

A minimum Cumulative Grade Point Average of 2.50 is required to complete the programme. In other universities, such as Makerere University, programmes are described in terms of Plans (Pathways), i.e. Coursework and Dissertation (Plan A) or Research only (thesis - Plan B). In Plan A, a student accumulates 23 credit units worth of coursework during the first two semesters and must submit a dissertation as a partial fulfilment that shall carry ten credit units, and it appears on the transcript. In Plan B, a student devotes time to developing and defending the research proposal, which takes three academic years comprising six semesters. The remaining two years will be spent on fieldwork/data collection, thesis writing, and defence. The university hosts central courses known as Audited Courses, which are taken by candidates on the supervisors' advice to audit specific courses to strengthen their capacity for research in Information Science. Credits are not awarded for such courses.

5.7 Justification for a KM programme

An attempt was made to assess the key issues that justify the need for the programme in the institutions studied. These issues include international/global agenda in knowledge management, vision and national development plan of the country, professional gaps and/or development, and knowledge transfer and/or linkage with the industry. Generally, the KM curriculum is justified based on international, national, professional and knowledge transfer needs. The observations are as detailed below:

- **International/Global Agenda in Knowledge Management:** The new trends in information management address knowledge management needs. Knowledge is a powerful tool if applied appropriately in an institution. Addressing the global need to manage intellectual and knowledge-based assets of modern institutions requires effectively managed knowledge to help organisations make informed decisions. For instance, at IUM, Namibia, the programme addresses the global need that recognises a "strong consensus that knowledge is the key driver of socio-economic development". The need for creating knowledge-intensive organisations to fit in the knowledge era and innovations for socio-economic development and the management of organisations was required. For nations to address the United Nations agenda for Sustainable Development Goals, the skills needed in information processing, retrieving, preserving, and dissemination should move in the same direction.

- **Vision and National Development Plan of the Country**: Contribution to the social and economic growth of the respective national agenda is important and requires curriculum support. In Uganda, Kenya, Namibia, and South Africa, reference to national vision and national development plans was a critical factor in curriculum support. In Uganda, for instance, the Vision 2040 and National Development Plan III (NDP3), Kenya Vision 2030 and Namibia Vision 2030 indicated a component of the knowledge management framework. For instance, Kenya's National

Development Programme and Vision 2030 address the need to embrace knowledge management for sustainable development, which requires trained scientists to manage information. Namibia's Vision 2030 specifies a need "to transform Namibia into a Knowledge-Based Economy (KBE)", which demands intensifying knowledge management utilisation to accelerate national development. This explains why the programme at IUM, Namibia, is designed to engage qualified interested individuals to acquire a wide range of knowledge-sharing practices and tools, innovation creation, and application of ICT tools in knowledge management.

- **Professional Gaps and/or Development:** Knowledge management is an existing gap among library and information science professionals. Whereas librarians, archivists, records, managers, and publishers undergo a curriculum in information management, some aspects of knowledge management possess a gap. In addition, the information science that addresses different aspects of KM seems too general to address the needs of KM skills and competencies required. Indeed, the knowledge management programme at IUM, Namibia, attempts to address the global strong consensus that knowledge is the key driver of socio-economic development.

- **Knowledge Transfer and/or Linkage with the Industry**: Limited synergies exist between library information science and industry. In the field of teaching and learning, there is also limited collaboration and cooperation in teaching and learning within the same university and across universities in Africa. The industry demands a specific area of knowledge management training, and thus, there is a need for a specific area of knowledge management training. Developing a collaborative programme to integrate field trips/visits, industrial attachments, talking by alums, and opportunities to address by the captains of the industry is a priority, and inter-faculty collaboration would contribute immensely to an appropriate curriculum in Africa.

5.8 Knowledge management content

The second objective of the paper was to assess occupational professional skills and competencies exhibited by the curricula. This identified the core/broad areas, the competencies, cross-cutting courses and proposed career growth projection. The table below shows the mapping projection below:

Table 2: Content distribution

Knowledge Area (KA)	Content distributed by KA
KA1: Understanding of Concepts, Principles and Theories	Knowledge economy, knowledge management systems, forms of knowledge, knowledge transfer, challenges in knowledge management, fundamentals of knowledge management, knowledge management systems, database management systems, organisation leadership and knowledge management, principles of knowledge organisation and classification
	Types and characteristics of knowledge, systems ICTs and digital networks and the globalisation of the economy, knowledge-based economy and knowledge society, information management, information science, computer science, ICTs, and digital networks
KA2: Proficiency in Research Methodology, Data Analysis, and Management	Knowledge engineering, academic writing, research methodology, research project (case study), design problem solving, visual storytelling, artificial intelligence, information systems analysis, information processing, computer programming
KA3: KM Systems and Practices	Organisational knowledge management, development of Knowledge content, knowledge management practices, tools and strategies, knowledge management technologies
	Communication and knowledge sharing, approaches to knowledge management, selection of knowledge management systems, ethical issues, and practices in knowledge management
KA4: KM Models, Standards and Policy	Knowledge auditing and mapping, Knowledge sharing platforms, canons, and facets of knowledge in managing information and records. Information innovation through design thinking digital media and society, information professionals, and information ethics

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Knowledge Area (KA)	Content distributed by KA
KA5: KM Applications	Indigenous knowledge systems and decolonisation, intellectual property management for knowledge management
	Management of innovations and digital transformation, knowledge management systems implementation, knowledge for sustainable development and records management

The expressed content expected of a KM programme rhymes with the expectations elsewhere. However, the multidisciplinary nature of the KM curriculum also demands a vast number of diverse fields, such as organisational science, document and information management, electronic performance support systems, technical writing and journalism, anthropology and sociology, and communication studies (Dalkir, 2011). Indeed, some authorities such as Jain et al. (2006) contend that KM focuses on the sharing of knowledge that has been created, acquired, and captured to achieve organisational goals and objectives. In most of the universities, there are distinct core and elective courses. There are clear courses such as Foundations of Knowledge Management and Knowledge Management Practices and Implementation, Knowledge Assessment and Evaluation, the Information Economy, Organizational Learning, and Knowledge Organization structures, systems, and services, most of which relate to what is outlined in the table above. Indeed, elsewhere in the world, curriculum design requires clear design such that elective courses enhance the foundation of skills, knowledge and expertise required in the information and knowledge management and practicum to allow students to connect theory from their learning experience to the real world. In NTU, for instance, the electives are in two groups: Group A Electives include information and knowledge assets, Knowledge management strategies and policies, Knowledge management technologies, and organisational theory and practice. Group B Electives include Business intelligence, Intellectual capital management, storytelling for organisations, Information mining and analysis, Information entrepreneurship, organisational leadership, My learning journey, and Leading through films and plays. In addition, students must conduct a research project, critical inquiry and cross-listed courses from other programmes, including business and management information sources and services. In Maryland, the elective courses provide flexibility to the programme and allow students to pursue their educational and professional interests in greater depth, including cyber threat intelligence, data science and analytics, game and entertainment analytics, information risk management and smart cities and connected communities. In Kent, students select 15 credit hours of electives in pertinent topics, six credits of which may be drawn from the disciplines of health informatics, library and information science, or user experience design. In addition, they also complete an internship, Master's project, Master's research paper or thesis as a 3-6 credit culminating requirement.

In order to assess the level of coverage of KM by those universities that offer it as a course unit, knowledge organisation and management offered by Makerere University for a Master's of Science in Information Science was reviewed to get the extent of the coverage on the KM. The program introduces learners to the principles of intellectual information organisation for storage and retrieval. The aim is to acquaint learners with different knowledge management tools and systems and help them apply these to managing information and knowledge. Some of the content taught in the course unit is summarised as follows:

Concepts, principles and practices of knowledge management, the universe of knowledge, the structure of knowledge classification, facet analysis, knowledge organisation systems (e.g. subject heading lists, classification systems, ontologies), knowledge representation, taxonomies, knowledge organisation structures: post-coordinate systems, Internet era (hierarchical, citation references, search engines and indexes), semantic web, development of knowledge management systems such as thesaurus construction, automatic KOS-based indexing and classification, and knowledge management practices in organisations (tacit knowledge capture, validation, processing, storage, sharing) (Makerere University, 2010).

5.9 Transferable skills and competencies expected of a KM curriculum

When asked what kind of competencies are expected of the curriculum, most respondents indicated the following transferable skills: intellectual (knowledge), practical, competencies and attitudes.

Table 3: Intellectual and practical transferable skills in KM curriculum

Transferable Skills	Examples
Intellectual and Knowledge	Ability to identify knowledge, collect it, a sound understanding of the critical issues in information and knowledge management in a variety of contexts, records management practices and principles
Practical Skills	Process knowledge acquisition, applying the knowledge acquired on the canons and facets underlying knowledge organisation, records, and information management, cataloguing and classification, disseminating information, knowledge systems management, knowledge, and digital content management.
Competencies	Relate knowledge and content management and information management¸ knowledge and digital content management, ability to analyse subject content of information materials for effective storage and retrieval, the capacity to interpret, evaluate, judge and apply the concepts, principles, and techniques of knowledge and information management, demonstrate an understanding of how to select appropriate knowledge management solutions
Attitudes	Ability to create an environment for safely discovering and using information and knowledge for competitive advantage; ability to think critically and epistemologically when dealing with real-life challenges in the information society and the new knowledge economy

Comprehending KM's transferable skills, knowledge, and competence would only be helpful when considering KM's technology management philosophy and practice, a social and enterprise movement, and a discipline. For example, as a practice, it promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing an enterprise's information assets. As a discipline, KM covers the areas of information management, records management, digital libraries, indigenous knowledge, information policy, publishing, archives management, preservation, and conservation, among others. The theoretical perspectives concern knowledge-related phenomena, underlying mechanisms and processes that affect knowledge management. KM promotes an integrated approach to identifying and sharing an enterprise's information assets, including databases, documents, policies, procedures, unarticulated expertise, experience resident in individual workers, and the science of taxonomy and organisation of knowledge and transforming knowledge. This model has three main phases of knowledge management: acquisition (knowledge creation), sharing knowledge and transforming knowledge into decisions.

5.10 Career growth and employment prospects

It was established that the career growth and employment prospects fall into three categories: academia, professional practice in the community, national and international organisations and institutions and knowledge transfer partnership, and for policy, strategy and governance as summaries in the table below.

Table 4: Career growth and employment prospects

Area of Prospects	Examples
Academic and Professional Practice	Knowledge managers, lecturers in information and knowledge management, data analysts, librarians, records managers and archivists, researchers, editors and publishers, media information managers, information analysts, knowledge management specialists, public information officers, documentarists, information media analysts, librarians, archivists and records managers, knowledge managers, information architects, children's librarians, competitive research strategists, law librarians, health informatics experts, digital preservationists, usability analysts, museum collection specialists.

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Area of Prospects	Examples
Knowledge and Technological Transfer and Technology Innovation	Multipronged industrial set-up, info-entrepreneurship and business management consult, technology and technical innovation information management. Technological information management such as search engine optimisation, social media management, online digital marketing, KM experts, and professionals for leadership positions that bridge the gap between technology-oriented staff, functional personnel, and management. Professionals that address the growing need for skilled information professionals who can strategically manage information and technology assets to fulfil critical information needs in organisations. Many prospects of entrepreneurship and job creation
Policy, Strategy and Governance	Governance and social policy sector, and civil society. Policy experts and strategy in information knowledge management, technical innovators expert. Leadership experience from corporations, including, among others, leadership experience in the information management field. Professionals to address the ethical, political, social, and technical issues related to information management in modern society and information network consultants and more

In general, the career prospects are immense, determined by the programme's design, and depend on the involvement of the industry sector where the graduate is likely to work. Based on the different units taught, the programme does not lead to specific career growth. However, candidates are trained to fit into the field for which knowledge and skills are needed in knowledge and information management. The knowledge and technological transfer and innovation wing brings new approaches and perspectives in knowledge management, most of which are not acquired in other programmes such as information science and information management. This is why the KM wheel, models such as the resource, Japanese, and process models come into play. The Japanese model, created by Nonaka and H. Takeuchi in the early 1990s (Spahic et al., 2014), indicates that knowledge (silent (hidden) and formal (available)) goes through a value chain: knowledge acquisition, storage, dissemination, and application. To Nonaka and Takeuchi, the value of knowledge is created as it is transformed through four different modes of interaction between tacit and explicit knowledge (socialisation, externalisation, combination, and internalisation). Therefore, a curriculum is needed to handle the technological management of information and the construction of information management systems, which can be achieved. This can only be achieved by managing people primarily involved in assessing, changing, and improving human individual's skills and/or behaviour.

5.11 Strategic directions

The third objective was to establish opinions on the strategies for guiding curriculum review and development of knowledge management in Africa. Participants were given attributes and were required to select what they thought would best describe a KM programme. The selection from the respondents was tallied to find out the best favoured as presented in the table below;

Table 5: Attributes of a KM programme

Attribute	%
Core courses in knowledge and information management provide a firm foundation for graduates	67
Specialised and elective courses prepare the student for research and future career	56
Practicum courses allow students to blend with theory and elective courses and enable students to pursue educational and professional interests in greater depth	33
Innovative curriculum with industry professionals prepares our graduates to apply their skills directly and immediately in their careers	44
Our students work on projects with industry partners and have opportunities for hands-on learning at the university	22

Attribute	%
The blended learning approach enables students to read and research extensively in each of the courses	33
Our curriculum captures cross-cutting, emerging issues and trends such as climate change, gender, and data management that open student opportunities in working in a dynamic world	11

Core courses in knowledge and information management provide a firm foundation for graduates. These are in addition to specialised and elective courses that prepare the student for research and future careers.

5.12 Major challenge(s) in KM curriculum in Africa

The major challenges are efficiency, competitiveness, and relevance to the local context. The curriculum does not often adequately address African organisations' unique local contexts and challenges, leading to a lack of practical solutions. There is also a paradigm shift in knowledge management with advancement in new technology. The challenge with the KM curriculum originates from the subject KM itself. The most significant factors are resistance to change, information overload, rapidly evolving information, integrity, security and compliance, inadequate user training and adoption, and lack of clear ownership and responsibility.

5.13 Suggestions on strategies to improve KM curriculum in Africa

- **Curriculum Review and Update**: Regularly review and update the curriculum to ensure it aligns with industry needs, incorporates emerging technologies, and addresses contemporary challenges African organisations face. Also, incorporate indigenous knowledge management in the curriculum practical units

- **Industry-Academia Collaboration**: Collaboration with the industry and proper infrastructure be established to support KM. Foster partnerships between educational institutions and industries to understand real-time challenges, co-create curricula, offer internships and provide practical experiences to students.

- **Faculty and Professional Development**: Invest in training and development programmes for faculty members to equip them with the latest KM practices, tools, and teaching methodologies. Encourage participation in industry projects to gain practical insights. This is one way to strengthen professional associations and organisations. Establish specialised areas of training that commence from first-year university entrance and link the student and industry. Lecturers need to be retrained in new trends in knowledge management.

- **Experiential Learning**: Integrate practical experiences, case studies, internships, and hands-on projects into the curriculum to allow students to apply KM principles in real-world scenarios.

- **Interdisciplinary Approach:** Promote interdisciplinary learning by incorporating diverse perspectives from business, technology, social sciences, and humanities to provide a holistic understanding of KM.

- **Standardise the Titles of the Programmes** to avoid confusion.

- **Local Context Integration:** Tailor the curriculum to address African countries' unique socio-economic, cultural, and organisational contexts to ensure relevance and applicability.

- **Technology Integration**: Emphasise the role of technology in KM by including training on relevant software, data analytics, AI, and other tools to manage and extract value from organisational knowledge.

- **Continuous Feedback Mechanism:** Establish a feedback loop involving students, alums, industry partners, and faculty to assess and improve the curriculum's effectiveness and relevance continuously.

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- **Promotion and Awareness:** Sensitise practitioners and academics to the place of KM through conferences, workshops, and seminars. Aggressive marketing of the programmes is needed to increase their visibility.
- **Research and Innovation**: Encourage research in KM to foster innovation, develop best practices, and contribute to the global body of knowledge in KM.

6 Conclusion

This paper is meant to develop a framework to guide the development of a knowledge management curriculum in Africa. It was set to assess the kind of curriculum being implemented in respective African universities, assess the occupation professional skills and competencies exhibited by the curricula, and develop strategies for guiding curriculum review and development of knowledge management in Africa. The parameters and justification of the KM programme follow the Trait theory (Rubin, 2004) professional discourse as a substantial body of theoretical knowledge that forms the intellectual foundation of the KM discipline using the primary criteria for curriculum development: the learning process, the learning target and learning context. Linking the industry and the theory as guided by four knowledge conversion processes—transforming hidden knowledge to formal knowledge is an integral part of the curriculum design.

In Africa, the titles of KM programmes differ, ranging from Master of Philosophy, Master of Science in Information and Knowledge Management, and Master's in Information Management. Most aim to equip learners with knowledge and skills to harness knowledge in different formats to manage knowledge-based assets in society effectively. The skills in identifying, collecting, and processing knowledge for use, applying ethics, methods and strategies for the acquisition, capturing organisation, sharing, using, and reusing knowledge are critical to addressing all levels of Broom's taxonomy.

The minimum entry requirement for the Master's degree is a Bachelor's degree with some consideration of special courses in IT and working experience. The modes of delivery ranged from hybrid, face-to-face, and online. The programme structure comprises coursework with research (dissertation/project on which the student must submit a dissertation for examination. The knowledge management content and career growth do not significantly differ, nor do those of the other universities outside Africa. The approach of industry, KM society, and environment determines the intensity of teaching and learning. There is, however, the challenge of local context and relevance, leading to a lack of practical and industry compliance. With a paradigm shift in knowledge management and the advancement of technology, there is a need for the curriculum to be relevant and up-to-date to address industry-academia collaboration within inter-institutional and regional (Africa) for integrated faculty and professional development. This will enable the development of experiential learning and integrate local context with an interdisciplinary approach. This requires a continuous feedback mechanism with integral research and innovation and a standardised approach to guide curriculum review and development in Africa.

7 Proposed Framework for Knowledge Management Curriculum in Africa

The following are parameters to guide the KM curriculum in Africa:

- **Titles of the Programme:** Universities should be guided by the context in naming the programmes, whether knowledge management (KM), information management (IM), knowledge organisation and management, or knowledge and information management (KIM). In any case, the contents of information management are critical to addressing the organisation of the knowledge component of KM.
- **Curriculum Orientation of KM:** The design of a KM curriculum should be precise, such as a science, an art, a practice, or a discipline. Balancing professionalism practice and academia should

be well reflected in the programme objectives, learning outcome and the content. Professionalism, the popularity of the programme, practical orientation and training for local needs, and the ability to address vocational indigenous/local and international needs are critical. In addition, balancing theory, practical skills, internship, well-structured curriculum, and technical and industry transfer needs is necessary.

- **Entry Requirements:** Entry requirements or expectations should reflect the university policy and goals of the programme but consider the competencies in basic computing skills and experience that the hosting university may consider necessary. In addition, understanding the knowledge assets of tacit and explicit knowledge is necessary.

- **Information Management in KM Curriculum**: The KM curriculum should be appropriate for information and knowledge management professionals. It requires a guide to address the knowledge, skills, and competencies expected of a KM graduate.

- **Joint Seminars and Continuing Education:** The design of a Master's programme could apply the modular form so that participating institutions would host collaborative seminar series/summer schools. This is in addition to increased involvement in private-public partnerships and industry mentorship, which added value to the curriculum design.

- **An African Joint Collaborative Curriculum:** A team of experts from African universities could be constituted to develop a collaborative curriculum that respective universities can host. Respective universities may customise such a programme to promote joint curriculum management.

- **Curriculum Collaboration and Management:** Institutional or multi-institutional and multinational collaboration in hosting, managing, and running a KM curriculum is required. This includes the exchange of visiting faculty, staff, and students between and among the various cooperating academic units, supervision and external examination, and mutual exchange of information such as scientific and technological literature.

- **Developing Learning Communities:** Communities of Practice (CoPs) are needed to help people or groups share information on various areas, challenges, or problems that need discussion and help others connect nationally and internationally. Participating institutions in promoting this framework on the KM curriculum in Africa would promote this COPs programme.

8 Recommendations for further research

- **The professionalism of KM**: Professions are accepted or rejected based on a substantial body of knowledge, education, substantial autonomy, and control by canons of professional ethics. This study did not go beyond content; therefore, a deeper study to map professional practice into the professionalisation of KM is required.

- **Choice of the KM content:** Whereas the KM content was mapped according to the Knowledge areas, each institution needs to thoroughly analyse which course units should be included when designing the curriculum. This is true for learning objectives, outcomes, and competencies.

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20. Integrating Artificial Intelligence Literacy in Library and Information Science Training in Kenyan Academic Institutions

Rachel Kagoiya*; Sally Chepchirchir**
Technical University of Kenya, Kenya
gacecikagoiya@gmail.com

**Karatina University, Kenya*
schepchirchir@karu.ac.ke

Abstract

With the rapid technological advancements, Library and Information Science (LIS) programs should evolve to equip students in academic institutions with Artificial Intelligence (AI) skills and knowledge to meet the demands of the information profession. The objectives of this paper were to establish the current state of AI literacy in LIS training in academic institutions in Kenya, examine the extent to which AI literacy has been integrated into LIS curricula in academic institutions, identify the challenges and opportunities associated with the integration of AI literacy in academic institutions in Kenya, and propose critical recommendations that the management in academic institutions should consider for integrating AI literacy in LIS training in Kenya. The study employed a mixed-methods approach, combining qualitative and quantitative data collection methods. Quantitative data was collected through bibliometrics analysis, while qualitative data was collected using a systematic literature review and observation. Data was collected from Google Scholar using Harzing's "Publish or Perish" software and academic institutional websites. It was analysed using Microsoft Excel, Notepad, and VOSviewer and presented using tables, graphs, and figures. The findings reveal that LIS professionals must possess essential skills and competencies in AI to meet the evolving needs of the job market. The study highlighted valuable practical insights and recommendations to the management in academic institutions on a comprehensive understanding of the opportunities and challenges presented by AI literacy in LIS training, offering a foundation for future research, policy development, and pedagogical innovation in the field.

Keywords: *Emerging trends, comparative advantage, professional development, digital technologies*

1 Introduction

In the rapidly evolving landscape of information and technology, the infusion of Artificial Intelligence (AI) into various sectors has become inevitable (Xu et al., 2021). Libraries play a pivotal role in managing, organising, and disseminating information, making it imperative for professionals in this field to comprehensively understand AI - from its advantages, disadvantages and untapped potential. Library and information professionals have long offered their diverse users short courses on information literacy, computer literacy and digital literacy to assist them in navigating, accessing, analysing and retrieving required information resources (Landøy et al., 2020).

As academic institutions strive to equip their students with the knowledge and skills necessary for the 21st-century workforce, integrating AI literacy into education has become critical to academic curriculum development (Chen et al., 2020). Long et al. (2021) define AI literacy as a set of abilities to understand, use, monitor, and critically reflect on AI applications. AI literacy encompasses AI competencies that the general population should possess and accordingly focuses mainly on learners without a computer science background ("non-experts"). Scott-Branch et al. (2023) opined that AI literacy includes knowledge, abilities, and experience in understanding and using AI and a deep analysis of its detriments and readiness to explore untapped AI further.

Like many other nations, Kenya is witnessing AI's transformative impact across diverse industries. Libraries are not immune to the influence of AI, which has the potential to revolutionise traditional library services, automate routine tasks, and enhance information retrieval processes. Recognising the need to prepare LIS professionals for this paradigm shift, academic institutions are increasingly exploring ways to integrate AI literacy into their curricula (Munyoro & Mutula, 2018). This aims to empower future LIS professionals with the knowledge and skills required to harness the benefits of AI in their roles. It also means addressing the growing demand for LIS professionals to navigate the intersection of information science and cutting-edge technologies. This strategic move aligns with global trends in the field, ensuring that graduates from Kenyan academic institutions are well-versed in standard library practices and proficient in leveraging AI tools and techniques.

Laupichler et al. (2022) assert that as AI technology evolves, integrating AI literacy in LIS training in Kenyan academic institutions is not just a forward-looking strategy but a necessity as it aligns information professionals with the demands of the digital age. This integration represents a proactive measure in response to the dynamic global information landscape, fostering the development of a cohort of information professionals capable of adeptly navigating and contributing meaningfully to the evolving digital future. Further, the Global Student Survey (2023) on the impact of Generative AI on higher education indicates that nearly two-thirds (65%) of students from across 15 countries (including Kenya) would like their curriculum to include training in AI tools relevant to their future careers.

It is fundamental for academic institutions and LIS professionals to not only leverage the numerous capabilities of AI but, importantly, as Scott-Branch et al. (2023) point out, they must take precautions on its ethical use, deeply analysing its challenges. Sabzalieva and Valentini (2023) explore generative AI tools such as ChatGPT, highlighting their potential benefits and acknowledging the challenges and ethical implications. Concerns include issues related to academic integrity (particularly plagiarism and cheating), regulatory gaps, privacy concerns, accessibility barriers, and the inability to detect distorted or altered information. LIS professionals must evaluate the use of AI regarding privacy, mis/disinformation, ethical decision-making, diversity, and bias, which are imperative (Long et al., 2021).

Emphasising the importance of prioritising ethical considerations in AI literacy programs, Gong et al. (2020) underscores the need for academicians to strengthen the capacities of students' awareness in using AI responsibly and not just prioritise developing new AI technologies.

2 Rationale of the study

AI continues to provide numerous possibilities for innovation, improved decision-making, and cost-effectiveness (Umer Sultan, 2023), as well as for transforming teaching and learning in academic institutions (Al Husseiny, 2023). Fundamentally, academic staff in charge of preparing future LIS professionals are required to build their own competencies and skills in AI so that they are equipped to integrate AI into the curriculum and teach it effectively (Scott-Branch et al., 2023).

However, Neupane and Sibal (2021) observe that although a few universities and educational institutions have introduced specialised capacity development courses for AI literacy to strengthen students' competencies, there is still a gap in human resource capacities and requisite infrastructure for teaching and learning AI.

In Kenya, the Commission for University Education (CUE), the Government agency mandated to regulate university education, listed 43 public and 36 private universities accredited and authorised to operate in the country (CUE, August 2023). Out of these 79 accredited universities, at least 25 offer undergraduate and postgraduate academic programmes in library studies, information science and knowledge management (CUE, December 2023). This paper sought to analyse these 25 universities and their integration and/or

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preparedness to integrate AI literacy in their training of LIS professionals. Information and data in the existing literature on integrating AI literacy in academic institutions in Kenya were analysed from scholarly resources, including books, journals, reports, and academic institutional websites.

Specifically, the core objectives of this study were to (i) establish the current state of AI literacy in LIS training in academic institutions in Kenya (ii) examine the extent to which AI literacy has been integrated into LIS curricula in academic institutions in Kenya (iii) identify the challenges and opportunities associated with the integration of AI literacy in academic institutions in Kenya and (iv) propose critical recommendations that the management in academic institutions should consider for integrating AI literacy in LIS training in Kenya.

3 Methodology

This study employed a mixed-methods approach, combining qualitative and quantitative data collection methods. Quantitative data was collected through bibliometric analysis, while qualitative data was collected through a systematic literature review.

Data was collected from Google Scholar using Harzing's "Publish or Perish" software, analysed using Microsoft Excel, Notepad, and VOSviewer, and presented using tables, graphs, and figures. The publications on integrating AI literacy in LIS training in academic institutions in Kenya were analysed. The documents analysed included books, journal articles, theses, conference papers, and academic institutional websites. The documents were identified from Google Scholar using Harzing's "Publish or Perish" software.

The keywords and phrases used to retrieve data included "LIS training," "artificial intelligence," and "Kenya." Based on the identified gaps in the study and to improve the rigour and trustworthiness of the data and results, the researchers further used a purposive sampling technique to select a few academic institutions that were specifically investigated to align with the study's objectives.

The data was analysed using descriptive statistics and content analysis. This was done using Microsoft Excel, Notepad, and VOSviewer version 8.

The findings of this study will provide valuable practical insights and recommendations to academic institution management on the opportunities and challenges presented by AI literacy in LIS training. This would provide a comprehensive foundation for future research, policy development, and pedagogical innovation.

4 Findings

A systematic literature review was used to search Google Scholar using Harzing's Publish or Perish software program. The keywords used for the search included variables in the paper's title ("LIS training", "artificial intelligence", and "Kenya"). The search, conducted on 20th January 2024, resulted in a total of `nine publications. Further screening was conducted per the PRISMA checklist (see Appendix A) to refine the research scope and relevance. Four publications met the inclusion criteria and were deemed relevant to the study. One publication did not meet the inclusion criteria and was therefore excluded based on not having a date of publication, which meant they were ineligible by automation tools. The authors then added a limitation to the study, such that only materials published between 2019 and 2024 were included. Four publications were excluded since they were published between 2003-2018. Therefore, the authors selected four publications for a systematic literature review.

Further, the authors reviewed the undergraduate and postgraduate degree programmes offered in Kenya's accredited 79 academic institutions (CUE, August 2023). From this list, the authors noted that none of

the universities offered an explicit programme on artificial intelligence. On 20th January 2024, the authors deemed it fit to augment the findings by conducting a thorough search on selected academic institutional websites, which showed that some universities had started offering AI programmes and/or courses. These include the University of Nairobi (which offers a short course in AI and also offers a unit on AI applications under the Bachelor and Master of Science in Computer Science programmes), Jomo Kenyatta University of Agriculture and Technology (offering a Master of Science Artificial Intelligence), Strathmore University (that has a specialisation in Artificial Intelligence for their PhD in Computer Science programmes), Kenyatta University (offering a unit in AI for the Bachelor of Science in Information Technology programme) and Maseno University (Master of Science in Artificial Intelligence).

In line with the objectives of this study, particularly the scope of AI integration within LIS academic programs in Kenya, further investigation is needed to assess which of the 25 universities that offered undergraduate and postgraduate academic programmes in LIS and/or knowledge management (CUE, December 2023) have incorporated AI in their curricula.

4.1 Infometric analysis on the Integration of AI in LIS training in academic institutions in Kenya

Informetric analysis on the integration of AI in LIS training in academic institutions in Kenya serves as a valuable tool for assessing the current state, identifying trends, and informing future directions for advancing AI education within the field of LIS in the country, as shown in Figure 1.

4.1.1 Number of publications on LIS training in AI in Kenya

The data before screening had nine publications. As per the analysis, the findings showed that the first and oldest publication was published in the year 2003 and authored by M.K. Minishi-Majanja and D.N. Ocholla with the title Information and Communication Technologies in Library and Information Science Education in Kenya, as *shown* in Figure 1. One publication did not indicate the year of publication. Therefore, the cleaned data had eight research publications on LIS training in artificial intelligence in Kenya.
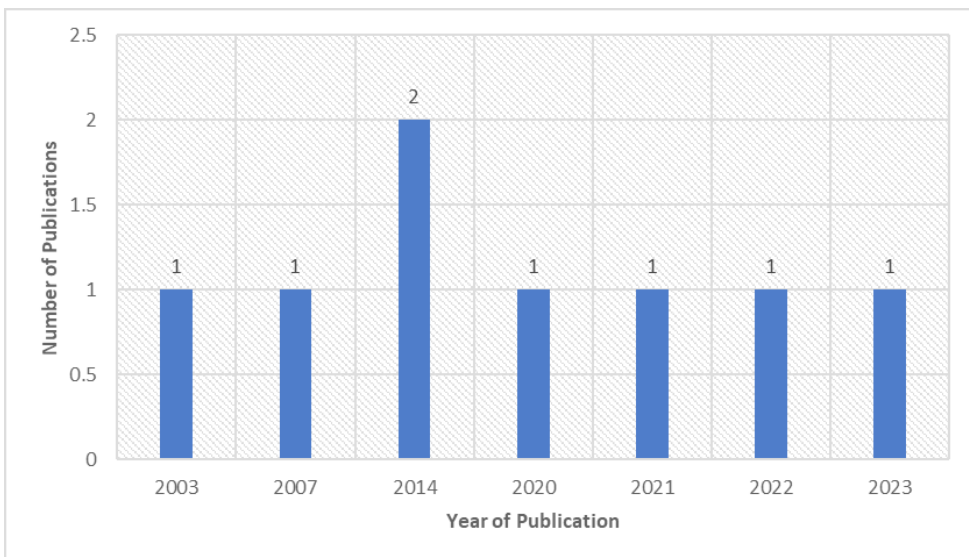
Figure 1: Number of publications on the integration of AI literacy in LIS training in academic institutions in Kenya

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Figure 1 indicates that between 2003 and 2023, only eight publications were published, with 2014 being the only year with two publications. The other years, 2003, 2007, 2020, 2021, 2022, and 2023, each had one publication.

The authors thoroughly screened all eight publications published between 2003 and 2023 to assess the integration aspects of AI literacy in LIS programmes within academic institutions in Kenya. Table 1 critically analyses each publication's observations about the study's objectives. In summary, the collection of publications spans various formats, including conference proceedings, journal articles, and a newsletter. It explores pertinent themes within Library and Information Science (LIS) education and practice, primarily within the African context.

In the conference proceedings "Integration of ICTs in Library and Information Science Education in sub-Saharan Africa" by M.K. Minishi-Majanja, the author notably observes the inclusion of Artificial Intelligence (AI) modules in LIS programs in African universities, marking a significant advancement in the curriculum to align with technological trends.

Similarly, the journal article "Information and Communication Technologies in Library and Information Science Education in Kenya" by Minishi-Majanja and Ocholla underscores the integration of ICTs within LIS programs in Kenya, indicative of a broader trend towards incorporating technology in educational curricula to equip students with relevant skills.

Contrastingly, "Training of Library and Information Professionals for the 21st-century Job Market in Nigeria" by A.O. Simisaye critiques the Nigerian LIS education system, suggesting a curriculum redesign to bridge the gap between training and market demands. This aligns with the findings of "Examining the Gap between Employers' Skills Needs and Library and Information Science Education in Zimbabwe" by N. Pamsipamire, highlighting similar skills and competency gaps in Zimbabwe's LIS education system.

Furthermore, the journal article "Information Professionals of the Future and their Prospects in the Era of Fourth Industrial Revolution" by YA Ajani et al. emphasises the necessity for synergy between LIS training institutions and industry demands, advocating for a curriculum that encompasses Fourth Industrial Revolution characteristics, including AI literacy. Outside of Africa, "Video Games and Learning: What Boys Learn from Video Games and Can it Map to the Common Core Standards?" explores the potential of using AI characters in game-based learning, indicating a broader global interest in leveraging technology for educational purposes. In the context of digital resources, the conference proceedings "Use of E-Library and E-Resources by Staffs and Students in the Colleges" by M.P. Gupta and A. Sanvalia sheds light on the digital awareness and utilisation of electronic resources in educational institutions.

Lastly, the newsletter "Update CPDWL Newsletter, June 2021" serves as a platform for LIS professionals, providing updates and insights into ongoing discussions within the field and potentially fostering collaboration and knowledge sharing among practitioners. Collectively, these publications reflect the evolving landscape of LIS education and practice, highlighting technology integration, addressing skills gaps, and advocating for curriculum reforms to meet the demands of the digital era.

4.1.2 Popular sources on LIS training in AI literacy in Kenya

The analysis of keywords in the titles of the publications "LIS Training," "Artificial Intelligence," and "Kenya" revealed that the most common phrases were the terms "library" and "education." Additionally, the most highly used and cited sources were journals from websites (HTTP) and in the form of "pdf," as shown in Figure 2.
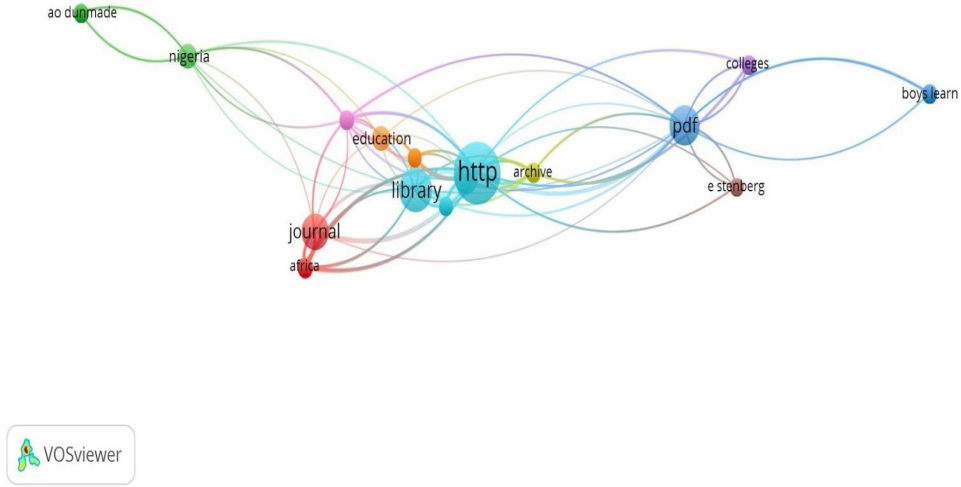
Figure 2: Popular sources on Lis training in AI literacy in Kenya

Figure 2 above indicates that there is no publication on AI literacy in academic institutions in Kenya.

4.2 Integration of AI literacy in LIS training in academic institutions in Kenya

As shown in Table 1, the study's findings show that no academic institution in Kenya has integrated AI literacy into the LIS curricula. However, the most cited source was a journal article titled "Integration of ICTs in library and information science education in sub-Saharan Africa" by MK Minishi-Majanja, published in 2007, with a citation mark of 89, as shown in Table 2.

Table 2: Citation metrics on integration of AI literacy in LIS training

	Cites	Per year	Rank	Authors	Title	Year	Publication	Publisher	Type
☑ h	89	5.24	3	MK Minishi-Majanja	Integration of ICTs in library and in...	2007	World library and informati...	archive.ifla.org	PDF
☑ h	31	7.75	5	TV Asubiaro, OM Bad...	Collaboration clusters, interdiscipli...	2020	Journal of Librarianship an...	journals.sagepub.com	
☑ h	19	0.90	1	MK Minishi-Majanja, D...	Information and communication t...	2003	Education for Information	content.iospress.com	
☑ h	5	0.50	4	AO Simisaye	Training of library and information...	2014	Journal of Education and P...	core.ac.uk	PDF
☑ h	5	0.50	6	N Pamsipamire	Examining the Gap between Empl...	2014		library.ifla.org	
☑	0	0.00	2	YA Ajani, T Adeyinka, ...	Information Professionals of the F...	2022	Mousaion	journals.co.za	
☑	0	0.00	7	MP Gupta, A Sanvalia...	Use of E-Library and E-Resources ...	2023	... of Libraries in ...	govtpgcollegekhargone.org	PDF
☑	0	0.00	8	S Hirsh, G Hallam, U La...	Update CPDWL Newsletter, June 2...	2021		repository.ifla.org	PDF
☑	0	0.00	9	JA Engerman, A Carr-C...	Video Games and Learning: What ...		thannual	ERIC	PDF

4.3 Key challenges and opportunities associated with the integration of AI literacy in academic institutions in Kenya

The four publications (Table 2) screened by the authors indicate that few studies highlight the challenges and opportunities associated with integrating AI literacy in academic institutions in Kenya.

However, from the Harzings publish or perish software search outcome, the authors observed a publication by Shukla et al. (2023) in the conference proceeding, titled "The Role of Artificial Intelligence in the Libraries of Law Institutes in Delivering of Legal E-Content and Services: An Overview" which highlighted critical challenges and ethical considerations for integrating AI literacy in academic institutions. These include:

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- Ethical and privacy concerns, especially around bias and discriminatory practices of AI algorithms and issues on data protection.
- Training and skill gaps in staff managing and maintaining AI systems and tools, including lack of AI literacy.
- Integration challenges, especially in AI systems, with existing institutional systems.
- Ineffective and irregular maintenance and updates of AI models and systems.
- High costs and lack of resource allocation for AI adoption and maintenance.
- Low user acceptance and lack of trust in AI-driven tools and services.
- Lack of legal and regulatory compliance on AI-generated content and policies.

Furthermore, Gupta et al. (2023) note that LIS training programmes in Kenya fail to sufficiently address current job market requirements due to inadequate teaching resources in LIS training institutions, lack of adequate ICT content in the courses, courses that are irrelevant to the job market and inadequate length of industrial attachment. Regarding opportunities to integrate AI literacy in LIS training in academic institutions in Kenya, the authors noted that LIS curricula provide an opportunity to incorporate AI-tailored modules, courses and programmes.

The author also observed a Global Student Survey (2023), which, as indicated in the literature reviewed (see introduction section 1), emphasises that nearly two-thirds (65%) of students from across 15 countries (including Kenya) would like their curriculum to include training in AI tools relevant to their future career. In addition, Scott-Branch et al. (2023) highlight the critical role that librarians play in teaching AI literacy to enable users to create and analyse AI-generated content, hence the opportunity to improve LIS training in academic institutions in Kenya.

5 Discussion of findings

The findings showed limited literature on integrating AI literacy in LIS training in academic institutions in Kenya, as shown in Table 2. Wamba (2022) opines that the disruptive nature of AI tools and systems requires that AI literacy programmes be adopted promptly to respond to the information-seeking behaviour of AI users in academic institutions.

Scott-Branch et al. (2023) opine that the proficiency and expertise already possessed by LIS professionals in developing and delivering information literacy and digital literacy programmes are advantageous and timely when designing AI literacy initiatives.

However, recognising the accelerating impact of AI on the information landscape, it is imperative for academic institutions to swiftly adapt AI to educational technology (Ayanwale et al., 2022). This adaptation aims to equip LIS professionals with the skills, knowledge, and expertise necessary for comprehending and analysing both AI's benefits and potentially detrimental aspects. This includes enhancing abilities such as strengthening self-learning experiences, refining writing skills, and acquiring proficiency in fact-checking and verifying AI-generated resources. Moreover, training should include guidelines on appropriately citing AI sources to avoid copyright infringement or plagiarism (Carobene et al., 2023).

Omame and Alex-Nmecha (2020) observe that AI is already incorporated in some libraries in African countries, such as virtual assistants in reference services, virtual reality for user experiential learning, and robots for book shelving. Therefore, LIS professionals in Kenya should enrol in continuous development and learning programmes to navigate AI libraries.

6 Conclusion

In conclusion, this research has delved into the crucial role of integrating AI literacy into LIS training within Kenyan academic institutions. As the digital landscape rapidly evolves, AI technologies are becoming increasingly frequent, transforming various aspects of information management and retrieval. Therefore, LIS professionals must have the knowledge and skills to effectively navigate and leverage AI tools.

Through a comprehensive review of existing literature and insights from information gathered through institutional websites of Kenyan academic institutions, this research has highlighted the significance of incorporating AI literacy into LIS curricula. By doing so, academic institutions can better prepare future information professionals to harness the potential of AI in enhancing information services, facilitating knowledge discovery, and improving user experiences.

7 Recommendations

AI continues to revolutionise, disrupt and transform how students generate and access information and interact with one another. Training students within the field of LIS is currently facing the challenge of keeping pace with the rapid advancements in AI. Therefore, there is a need to integrate AI literacy in LIS training to prepare the future of LIS professionals. The following are the key recommendations from the findings of this study:-

- The literature reviewed by the authors reveals that there are no comprehensive research publications in Kenya on the integration of AI literacy in LIS training. More research is needed on AI integration in academic institutions in Kenya, highlighting the benefits, challenges, and opportunities for the academic community.

- Effective integration of AI literacy in LIS training in Kenya requires reviewing existing curricula to include basic AI concepts and incorporating AI modules and courses. The management of academic institutions in Kenya should provide guidelines for reviewing LIS curricula and developing policies on AI integration in general. In addition, management should set aside dedicated budgets to support acquiring requisite AI tools and systems in academic libraries so that LIS professionals can access relevant AI infrastructure.

- Based on this study's findings, the authors recommend further investigation to assess strategies that encourage collaboration across the different departments in academic institutions in Kenya; for example, LIS departments should collaborate with computer science, IT, and engineering departments to co-develop and deliver comprehensive AI literacy programmes.

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Appendix A: PRISMA checklist

Identification of studies via databases

Identification

Records identified from Google Scholar using Harzing's publish or perish based on the title: Databases (n =9)

Records removed *before the screening*:
- Records marked as ineligible by automation tools as records with unidentified date (n=1)

Screening

Records assessed for eligibility after screening (n =8)

Records excluded due to limitation of the years (2019-2023) (n =4)

Eligibility

Records assessed for eligibility. (n =4)

Included

Studies included in the systematic literature review (n =4)

Source: Page et al. (2021)

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21. Information Literacy Skills Curricula and Policy for Medical Undergraduate Students at Moi University and University of Nairobi

Evans Motari Momanyi*; Emily Ng'eno**; Joseph Kiplang'at***

Lukenya University, Kenya
emomanyi@lukenyauniversity.ac.ke

Moi University, Kenya
**ngenojeruto@gmail.com; ***joseph.kiplanga't@africainternational.edu

Abstract

With data smog and several technological innovations, medical students must acquire information literacy skills (ILS) to master content, extend their investigations, and become more self-directed and life-long learners. This can be achieved by developing and implementing appropriate ILS curricula and policies. The study's objectives were to examine the ILS curricula in place to facilitate and support the delivery of ILS to medical undergraduate students and to assess the methods used to enhance the delivery of ILS to medical undergraduate students. A pragmatic research paradigm with a mixed-methods approach was employed in the study. The study adopted a descriptive survey design applied within a multiple case study, combining concurrent triangulation in data collection and analysis. The target population was 685 students comprising 6th-year medicine, 5ᵗʰ-year dentistry, and 4ᵗʰ-year nursing students, and 182 lecturers. A combination of stratified simple random and purposive sampling techniques was employed to obtain 353 medical undergraduate students, 62 lecturers in medicine, dentistry, and nursing specialisations, two university librarians, two heads of medical librarians, and six heads of departments. Data was collected using questionnaires and interview schedules. Quantitative data was analysed using descriptive statistics and presented using frequency distribution tables and bar charts. In contrast, qualitative data was analysed thematically based on the objectives and research questions and presented as a narrative. The findings revealed that although the ILS curriculum and policy were available, there was tiny implementation and accountability, indicating that the ILS curriculum and policy had not been reviewed to incorporate contemporary ILS.

Keywords: *Information literacy skills, ILS curricula, ILS perceptions, self-directed and life-long learners*

1 Introduction

People in all aspects of life need information. Information is a crucial resource characterised as processed material that aids decision-making, broadens knowledge and mental capacity, and alters a society's overall status (Madden, 2000). Adekunle et al. (2019) argues that information is crucial for decision-making and effective operation at all levels of any undertaking. To effectively utilise information, an individual requires ILS competencies (Baro, 2011).

According to Bruce (2004), ILS is the ability to locate, obtain, analyse, and utilise information. Similarly, the American Library Association (ALA) (2020) defined ILS as identifying when information is wanted and finding, assessing, and applying it appropriately. ILS is viewed as a community and individual empowerment tool in the twenty-first century. Additionally, the ability to recognise when information is needed has been defined as ILS by Hall (2010). Being aware of when information is required enables one to locate, retrieve, evaluate, and use it efficiently to either carry out further study or address the issue for which it was intended. ILS is the foundation of lifelong learning, which permeates all academic levels, learning contexts, and disciplines. Furthermore, ILS aids students in developing greater self-direction, greater control over their education, topic comprehension, and study breadth (Hall, 2010). The individual's agility determines the success of information literacy in an individual and how well they utilise learned ILS (Baro, 2011).

Moreover, ILS according to researchers such as Kavulya (2003), Gui (2007), and Gatero (2011), ILS enables students to obtain and utilise information to address specific issues in their study discipline. ILS, therefore, calls for the know-how to recognise, find, assess, and manipulate information ethically and for lifelong learning. From these definitions, ILS can depict the prowess of recognising when one is deprived of information. In a rejoinder to the deprived state, one locates, critically analyses it, and uses it for research and long-life learning.

Medical training and practice require students to update their information continuously for evidence-based medicine (Gatero, 2011). However, the growing size and complexity of library collections, coupled with the information explosion and rapid developments in ICT, pose a challenge to medical trainees. Additionally, despite the critical role that ILS plays in student learning, a study by Momanyi et al. (2018) on the utilisation of ILS among undergraduate students at Maseno University points out that among the barriers to the efficient utilisation of information, especially in developing countries is the relatively low level of information literacy skills. Without the ability to manipulate and use information effectively, investments in print and electronic-based resources may be wasted. Similarly, Kavulya (2003), Mutula et al. (2006), Amunga (2011), Lwehabura (2008), Gatero (2011), and Mugambi (2013) corroborate this claim by stating that even though lots of information resources and services are available in Kenya, they are not fully utilised due to lack of information literacy skills.

Interestingly, Mugambi (2013), in his study on the assessment of information literacy competencies of practising nurses at Kenyatta National Hospital, Kenya, revealed that practising nurses at Kenyatta National Hospital had four professional information needs namely, patient care, in-house presentation, presentation at a professional meeting/seminar and scholarship application/career development, in this regard the nurses preferred using human sources instead of online databases or print sources that were readily available. This can be attributed to inadequate information literacy skills, including searching, retrieving, evaluating, and utilising print and online medical databases. Sutton et al. (2014) echo these sentiments by asserting that most medical students cannot refine search strategies, criteria for selecting search terms, and appropriate information used to avoid plagiarising published scientific works. They cannot also apply their acquired information literacy skills to assess the reliability of online information sources.

Additionally, the ILS of undergraduate students pursuing medical-related courses depends on their capability to think critically and analytical problem-solving competencies. Mundave (2016) asserts that medicine students require critical discerning skills because medicine is an inquiry-based discipline. Critical thinking and problem-solving are vital tenets of ILS.

2 Significance of the study

The findings of this study offer a more practical approach for incorporating and implementing ILS in medical training curricula and help to create efficient pedagogic ways for teaching ILS to undergraduate medical students at Kenyan higher education institutions. The study's recommendations are also anticipated to significantly aid universities in re-engineering ILS training in course design, content development, pedagogical delivery techniques, and assessment procedures.

The outcomes of this study provide the basis for guiding university management and government initiatives in designing a national information literacy skills policy to help thrust the country into an information society.

This study has facilitated the understanding of the ILS competencies of undergraduate medical students, the significance of routine reviews and updates of ILS policy and curricula to foster the transfer of contemporary information literacy skills, the necessity of retraining and reskilling of information literacy skills instructors and information service providers, and the significance of ICT in ILS instructions. It also brings to the forefront the patterns of information search, utilisation, sharing, and use to improve patient confidence in healthcare delivery services in Kenya.

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3 Literature review

Scholars in information literacy like Kavulya (2003), Soto et al. (2004), Freeman and Lynd-Balta (2010), and American Library Association (2020) agree that ILS is a generic terminology that covers concepts like digital, visual knowledge of appropriate communication channels, academic literacy, information manipulation and management. Scholars Kavulya (2003), Freeman and Lynd-Balta (2010), and Klomsri and Tedre (2016) agree that ILS is the capacity to comprehend text, write it down, and use information and communication technologies to deal with online content successfully is correlated with electronic, visual, and multimedia literacy.

Lumande et al. (2006) assert that higher education in the 21st century requires strong components of ILS in its curricula to produce ILS-competent graduates. He further states that the level of ILS competency in a student is determined to a greater extent by the ILS policy in place that guides in crafting the ILS curriculum, ILS content delivery, facilitation on ILS evaluation, and collaboration mechanisms between librarians and lecturers (ACRL, 2010).

In order to support ILS in universities, IFLA developed an exhaustive paper in 2014 outlining the legal and policy framework to guide and facilitate ILS in educational institutions. The paper covers guidelines and standards established for ILS instruction and implementation. Moreover, Taylor (2006) acknowledges that information literacy standards are broad student outcomes that describe an information-literate student. Similarly, Kingori (2015) allude that performance indicators, levels of efficiency and examples are provided with the standards to enable library media specialists to measure students' competencies at various levels.

Universities worldwide have adopted various ILS standards and guidelines that recommend the skills students need to possess and demonstrate (Mokhtar et al., 2008).

In the UK, the Standing Committee for National and University Libraries (SCONUL) recommended Seven Pillars of Information Skills, which advocates for integrating ICT in ILS applications. For example, the University of West of England library, in acknowledging that a policy and a framework for imparting ILS is critical, states that in order to guarantee that every student who has completed a course of study at the University of West of England (UWE) becomes genuinely information literate, Library Services is eager to expand on current best practices, by giving them the abilities to assist in the job search and the knowledge required, once employed, to handle their information demands.

Librarians are heavily involved in training students on utilising the resources available, discovering and assessing information, and ethical issues in information, copyright, referencing, and plagiarism. However, not every student is given the chance to learn and then hone his/her ILS abilities regularly. Sometimes, the opportunities are ad hoc or inappropriate. To abolish these shortcomings, the University of West England library developed a policy framework stating that instruction is given to learners at every stage of their course to build their information skills. Summative and formative tests should be expanded to test the adequacy of ILS among learners.

In Kenya, the Universities Act No. 42 of 2012 and Universities Standards and Guidelines (2014) are two documents that emphasise how crucial it is for undergraduates to possess the right ILS to organise and utilise information efficiently. The Commission for University Education (CUE) published standards and guidelines for university libraries in Kenya in 2007. The fourth section of the guidelines stated that universities should motivate lifelong learning by integrating the best conventional resources with innovative methods and technologies and facilitating academic success.

These results are consistent with a study conducted by Katundu and Sife (2004) on information literacy skills in two Tanzanian public universities. She discovered that there was a lack of a policy framework for ILS training and that attempts to integrate library instruction, orientation, or user education failed to produce a workable policy that would have allowed for the development of an all-around individual user

who could locate, assess, use, create, organise, or share information. Furthermore, researchers like Kavulya (2003) point out that a significant obstacle to ILS training and education in Kenya is the lack of ILS policies and curriculum. Esterhuizen and Kuhn (2017) further note that the CHELSA only produced draft rules for usage in South Africa as recently as 2016. Apart from this endeavour, he said that most African libraries and educational institutions employ standards created in Western countries that do not represent African requirements and are thus never appropriate for the region.

In the same breath, Katundu and Sife (2004) state that before developing an ILS policy and curriculum for ILS training and learning in universities, a user ILS needs survey must be carried out before a literacy program is instituted. In addition, Bruce Six's frame theory states that the ILS curriculum should be developed and experienced according to the prevailing learning environment conditions.

Furthermore, Katundu and Sife (2004) state that many initiatives at the University of Sokoine and Dar-es-Salaam University have not succeeded in developing an all-around lifelong learner because no ILS policy makes ILS training a credit-bearing course. This research sought to fill this gap.

Because information literacy is multidimensional, developing practical information literacy training in an academic setting presents several obstacles. The essential skills facet of the Source Model offers seven critical skills for ILS instruction and learning: communication, numeracy, information, problem-solving, self-management, competitive, social, and cooperative, as well as labour and learning skills. According to Arp and Woodard (2003), teaching ILS just once is impossible. It has to be instructed and applied in several ways. They argued that learners must repeat the procedure of finding, assessing, and obtaining information from various sources. Further, Bruce's Six Frames model under the relational facet advocates for the design of an information literacy curriculum that helps learners develop imperative competencies that enable them to discern powerful strategies for analysing an area of study, thereby becoming long-life learners with prudent problem-solving abilities (Bruce et al., 2006).

Moreover, Freeman and Lynd-Balta (2010) state that institutions of higher learning should conduct ILS assessments to ascertain the effectiveness of their ILS curriculum in attaining the objectives set in the curricula, which among others, to improve the ILS of undergraduate students effectively. Stec (2004) defines three kinds of ILS evaluation methodologies based on whether the goal is to examine what learners have learned or their perception towards ILS learning, which are the prescriptive or diagnostic methods used to test students' knowledge and skills prior to instruction. Examples include conventional assessments and a review of a student's previous work. The formative evaluation approach evaluates how well learners perform and gives comments during training. Based on the comments, the trainer can alter methods of instruction as the class develops. Examples include drafting brief reflection/reaction essays responding to a reading task. Finally, the summative evaluation approach assesses what has been learned when education is completed. Some examples involve queries with multiple choices. According to LaBonte and Hoffmann (2012), ILS assessment and evaluation techniques involve quizzes, questionnaires with multiple choices, evaluation of portfolios, self-evaluation essays, simulations, observation, final grades, group discussions, and courses that require students to synthesise and use their knowledge through essays and reflective thinking. From the literature, it is clear that there is no formal method for effective ILS assessment and evaluation.

Nkebukwa (2004) observes that several university students cannot select the most appropriate sources or databases related to their studies and need assistance using the Internet and CD-ROM, especially in formulating search strategies and evaluating what they find. When they search for titles, they are ignorant about author, title or subject entries, which should be used as access points in the automated catalogue (OPAC) or manual catalogue. Others are unaware of the most appropriate databases applicable to their disciplines, such as MEDLINE, for those interested in medical issues. Experienced library users in automated databases are familiar with the Boolean logic principle, which consists of three operators: OR, AND, and NOT. However, students cannot use this logic unless they are taught. This can be achieved by

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analysing key concepts of a given topic to enable them to develop searchable terms or subject headings. Bruce's Six frames model through the relational variable proposes that teaching ILS should be crafted to encourage teachers to introduce unique perspectives on certain occurrences and help students develop new perspectives on the world. (Bruce et al., 2006).

Lwehabura (2008) asserts that librarians have influenced the introduction of ILS programs since they are specialists in most ILS tasks related to the knowledge domain. According to Katundu and Sife (2004), attempts to incorporate orientation, user instruction, or library training have not produced an all-around individual patron who can locate, assess, utilise, produce, arrange, or exchange information. Therefore, before implementing an ILS curriculum, Katundu and Sife (2004) propose conducting a user information literacy requirements survey to help develop an ILS curriculum to help students acquire these abilities. Bruce's Six-frame model, through the relational variable, states that developers of an ILS curriculum ought to consider ILS as a set of several information-interacting methods that are objective, subjective, or transformational. Similarly, Kavulya (2003) assert that Kavulya (2003) asserts that ILS instructions are delivered in a theoretical way since the insight gained cannot be applied right away, and those library teachings are library-centred rather than information-centred. Therefore, before beginning ILS instruction, it is vital to ascertain the student's degree of competency. Information communication technologies (ICTs) in libraries have allowed students to access information more quickly than before. However, they can still not recognise authority (authorship), distinguish between fact and opinion, identify bias, adjust the search or topic to suit their needs or assess the resources they have found.

A research study by Corrall (2007) in the United Kingdom on ILS curriculum and delivery revealed that ILS teaching is incorporated in 75% of bachelor's and graduate academic course curricula, aiming to achieve 100% integration in UK institutions. Likewise, Kennedy (2005) agrees that the Steely Library's Research and Institutional Services Faculty has developed a core set of lower-level courses constituting a sequential library curriculum. This curriculum guarantees that all learners learn in a modular format. Students eventually become more adept information consumers as they move through their courses. Furthermore, Freeman and Lynd-Balta (2010) and Hiscock and Marriott (2003) proposed that ILS should be incorporated into course modules offered in Australian universities because incorporating ILS into the curriculum is an excellent approach to motivating learners to acquire ILS.

Equally, Baro et al. (2013) provides two ways to construct ILS curricula: an integrated and compartmentalised curriculum. In the compartmentalised curriculum, ILS is imparted as a separate subject found in the curricula at all academic levels. This model's courses often emphasise the early phases of the ILS paradigm, including recognising the information required, locating that information and examining the information sources, content assessment, and applying information morally and lawfully for a given endeavour. The integrated curriculum covers information skills in multiple fields of study and extracurricular activities. Correspondingly, the relational variable in Bruce's Six Frames Model, ILS curriculum content, should assist students in finding fresh perspectives on a given phenomenon.

ILS has not received the credit it deserves in African universities' curricula (Lumande et al., 2006). In Nigeria, for example, the National University Commission (NUC), the universities' accreditation and regulatory body, requires all institutions to include an ILS course. However, very few universities have taken it seriously and offered it as a credit subject.

Dulle et al. (2004) and De Jager and Nassimbeni (2005) assert that most African universities, especially South African Universities, offer user training and library orientation. Most of them lack the potential to develop information users with appropriate ILS qualities, and there is minimal evidence of institutional devotion to ILS instruction and learning.

Additionally, Dadzie (2007) recommended in her research that patron education and library orientation modules at the University of Ghana be revised and made available as credit-bearing ILS units. Moreover,

Agyen-Gyasi (2008) alludes that user education is a crucial undertaking by university libraries in Ghana that aims to provide students with information-related abilities that will allow them to efficiently utilise the library's collections and services. Agyen-Gyasi (2008) recommended that university libraries design ILS programs to educate their patrons regarding the information materials and services available, where to locate them, and how to utilise best what is provided.

In Kenya, Kavulya (2003) and Kingori et al. (2014) acknowledge that universities in Kenya have a library user education topic as a component of the communication skills course unit, which is imparted along with library reading, information and writing skills whose overall objective is to enable users to utilise the library information resources effectively. Additionally, Odini (2014) notes that Kenyan educational institutions provide a variety of ILS programs. These include using library manuals and guides, personalised instruction or reference services, library instruction courses, and library orientation.

Though library orientation is a helpful tool, Kavulya (2003) disclosed how insufficient the time allotted for the lecture, presentation, and tour is for teaching new university students practical library skills. Library orientation programs should not be scheduled during either the first or second week of an undergraduate's stay at the university since this reduces participation and raises the possibility that learners are unaware of the library's importance to their academic lives. In addition, insufficient staff can briefly handle many first-year students.

Kavulya (2003) and Kingori (2015) agree that there are several problems affecting the ILS programs in Kenyan Universities, namely, how to manage the large number of students joining the universities; the need to update course materials to reflect changes in an automated setting; the dearth of computers suitable for classroom use; access to the World Wide Web and electronic databases; and training for all library employees to tackle the novel difficulties presented by an automated library.

Furthermore, literature has shown that standard assessment techniques are unavailable to ascertain the effectiveness of the ILS curriculum. Additionally, many learners engage in plagiarism, have inadequate critical thinking skills, have deficient information evaluation techniques, do not know information search strategies, do not understand intellectual property rights, relying heavily on Google as the primary source of information. This indicates the absence of ILS competencies, hence the low utilisation of ILS in accessing, evaluating, and evaluating information materials in Kenya; hence, this study will help bridge this gap. Therefore, this study sought to find out the ILS content covered by the ILS curricula, its relevancy, and mode of delivery to develop strategies to solve the challenges revealed in this section.

4 Research methodology

This study adopted the pragmatist paradigm since it provided a pathway to choose inquiry methodologies that best addressed the study research questions. As such, the selected mixed method strategy enabled the researcher to collect qualitative and quantitative data. The consequence of integrating quantitative and qualitative results is the likelihood of realising a wholesome scenario concerning the research topic (Johnson & Onwuegbuzie, 2004). Furthermore, Onwuegbuzie et al. (2009) argues that a research study that adopts mixed methods enables the triangulation of quantitative and qualitative findings. This research used concurrent triangulation. Data collection of quantitative and qualitative data was done simultaneously, ensuring that the advantages of quantitative data optimally countered the deficiencies of qualitative data. In blending the findings, the two data types were given equal significance. Quantitative and qualitative data were analysed separately, and the conclusions were mixed. The concurrent triangulation technique guided the researcher in comprehensively examining the problem of the study by using the two types of data to interpret the findings (Cohen et al., 2017). This study employed a descriptive survey design to describe the status of ILS among undergraduate medical students at the two selected universities.

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Undergraduate students in 4th year nursing, 5th year dentistry and 6th year medicine who were 397 were sampled using the table of determining sample sizes developed by Saunders, Lewis, and Thornhill (2012). The student sample size was determined by applying a 98% confidence level and a 2% margin of error. A sample of 62 lecturers was chosen based on a 95% confidence level and a margin of error of 5%. The purposive sample approach was used to pick two University Librarians, two Medical Librarians, and six heads of departments (three from each of the two universities under investigation). Purposive sampling is suitable when a study purposely targets certain respondents who are believed to have relevant information appropriate for the research inquiry (Kombo & Tromp, 2006). Data was collected using interviews and questionnaires. The study espoused both content and face validities. Content validity estimates how well data acquired through a certain data collection tool represents a particular set of indicators or ideas. (Klassen et al., 2012).

Face validity implies that the questions meant to test an idea should appear to test the ideas on the surface of the schedule. To ensure that the questionnaires and interview schedules are valid, the researcher sent out the tools for collecting data to ILS experts for recommendations, suggestions and proposals on desired changes that needed to be made in terms of question suitability, questionnaire structure, and interview schedule. The data was analysed statistically and qualitatively to provide answers to the study questions. The study examined qualitative data, segmented it into significant logical units, coded the data into significant descriptions or group labels, and grouped the groups of data into themes that responded to the research objectives and questions (Klassen et al., 2012). Similarly, the researcher assigned code groups based on a pre-established coding scheme while analysing statistical data. The chosen coding method suited the study's research objectives and represented the reasoning derived from the data (Babbie et al., 2007). The codes were then transformed into numerical formats (Klassen et al., 2012). The resulting data from these numerical representations enabled the study's description, explanation, summary, comparison and understanding of data through percentages, graphs and charts. The participants were guaranteed their privacy, confidentiality, and anonymity. The participants were also informed that it was within their right to withdraw from the study at any stage if they so wished without any authorisation. Additionally, the researcher complied with Moi University research ethical guidelines. Also, the study obtained a research permit from NACOSTI in Kenya.

5 Discussion and interpretation of the findings

The study sought to determine whether the institutions under study had an ILS policy and curriculum. The participants were requested to indicate whether their learning institution had an ILS policy and curriculum.
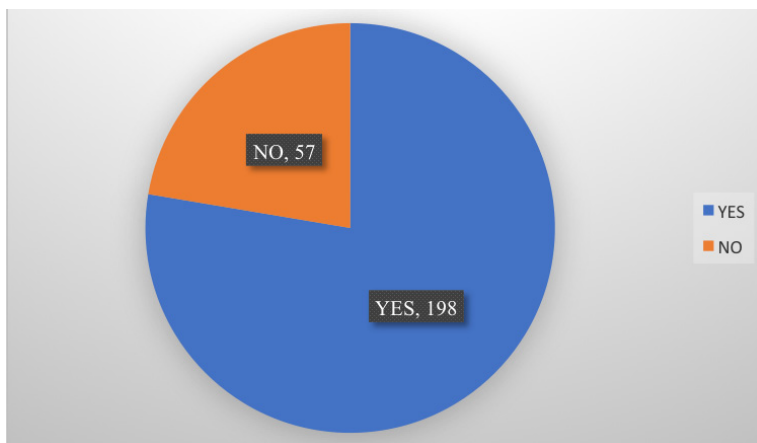
Figure 1: Availability of ILS policy (N=255)

The outcome in Figure 1 shows that 198 (77.64%) of the students indicated that their universities had a formal ILS policy that guided the training of ILS for undergraduate medical students, whereas 57(22.35%) of the respondents stated that ILS policy was absent.

The interviews revealed that institutions had an ILS policy and curriculum in place but did not use them in curriculum development and implementation. In addition, the interviewed respondents stated that the policies were outdated and did not reflect changes in the information realm.

In essence, one head of the department (HD01) commented:

> *"Yes, the ILS policy and curriculum is available, which guides students on searching and using information independently…The procedure also stipulates how the teaching of ILS ought to be carried out…however, the ILS policy has no timeframe on when and how it should be updated to cater for new developments in the information landscape…"*

Additionally, the students were requested to divulge the different skill areas covered by the ILS policy. Table 1 summarises the study's findings.

Table 1: Students' response on the ILS skills covered by the ILS policy (N=255)

Statement	SD		D		N		A		SA		Total		mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Knowledge and information skills	13	5.09	24	9.42	18	7.05	132	51.76	68	26.67	255	100	3.9	3.5
Problem-solving and critical thinking skills	15	5.88	29	11.37	13	5.1	148	58.04	50	19.61	255	100	3.7	3.4
Communication skills	8	3.14	12	4.7	10	3.92	124	48.62	101	39.61	255	100	4.2	3.8
Information technology skills	11	4.31	13	5.09	16	6.27	166	65.49	49	19.21	255	100	3.9	3.5
Social Responsibility skills	14	5.49	23	9.01	19	7.45	169	66.27	30	11.76	255	100	3.7	3.3
Referencing and legal issues skills	9	3.52	17	6.67	32	12.55	142	55.68	55	21.56	255	100	3.9	3.4

The outcome in Table 1 indicates that 200(78.43%) of the students affirmed that ILS policy and curriculum covered knowledge and information skills. At the same time, 37(14.51%) of the respondents disagreed that the ILS policy covered knowledge and information skills. Additionally, 198(77.65%) respondents expressed that problem-solving and critical thinking skills were contained in the ILS policy. In comparison, 44(17.25%) respondents disagreed that problem-solving and critical thinking skills were not contained in the ILS policy. Of respondents who stated that ILS policy and curriculum covered communication skills, 225(88.23%) and 20(7.84%) disagreed that ILS policy and curriculum covered communication skills.

Furthermore, 215(84.31%) respondents agreed that ILS policy and curriculum addressed information technology skills, whereas 24(9.41%) disagreed that information technology skills were not contained in ILS policy and curriculum. The study findings also revealed that the policy covered social responsibility skills according to 199(78.04%) of the respondents; however, 37(9.40%) disagreed that the policy covered social responsibility skills. Additionally, the referencing and legal issues skills facet was covered in the ILS policy, as stated by 197(77.25%) respondents. However, 26(10.19%) disagreed that the ILS policy and curriculum addressed referencing and legal issues skills.

Table 2: Lecturer's response on information literacy skills covered by the ILS policy (N=62)

ILS	SD		D		N		A		SA		Total		Mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Knowledge and information skills	2	3.13	1	1.56	1	1.56	53	85.94	5	8.06	62	100	3.94	3.46
Problem-solving and critical thinking skills	3	4.69	2	3.13	1	2.34	50	81.25	5	8.06	62	99	3.82	3.39
Communication skills	1	1.56	1	1.56	2	3.13	49	79.69	9	14.06	62	100	4.03	3.55
Information technology skills	2	3.13	2	3.13	3	4.69	51	82.81	4	6.25	62	100	3.86	3.40
Social Responsibility skills	3	4.69	2	3.13	1	1.56	47	75.00	10	15.63	62	100	3.94	3.50
Referencing and legal issues	2	3.13	3	4.69	2	3.13	50	81.25	5	8.06	62	100	3.90	3.43

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Table 2 shows that most of the lecturer respondents, 58 (93.76%), 55 (89.06%), 58 (93.76%), 55 (89.06%), 57 (90.63%) and 55 (89.06%) agree that knowledge and information skills, problem-solving and critical thinking, communication, IT, social responsibility, referencing and legal skills are areas covered by the ILS policy and curriculum respectively. On the other side, 3 (4.69%), 5 (8.06%), 2 (3.13%), 4 (6.25%), 5 (8.06%), and 5 (8.06%) lecturer respondents disagreed that knowledge and information, communication, IT, social responsibility, and referencing skills were covered by the ILS policy and curriculum. These insights are consistent with the interview outcomes, in which department heads stated that the ILS policies in place covered areas of knowledge and information skills, such as educating learners to utilise both technical and information skills suitable for their area of study. Furthermore, they pointed out that the communication skills exemplar in the ILS policy enabled students to learn how to retrieve, arrange, and convey information, especially via technologically driven activities, as well as the problem-solving skills exemplar, which trains one on how to locate, gather, examine, handle, and utilise pertinent details in a variety of media.

The finding concurs with Kavulya (2003), Mathangani and Irura (2014), Kingori (2015), and Anyaoku et al. (2015) in their various studies which found that training on the use of library resources has been an integral part of university academic training for ages. This was done through orientation programs and various user education initiatives involving one-on-one and classroom-based instruction. Moreover, Dubicki (2013) states that the basic and foremost important focus of institutions of higher learning is to ensure that all faculties work in tandem to graduate information-literate students who can effectively utilise information literacy skills in the workplace, as well as make informed decisions in their personal lives, long after leaving the institutions of higher learning. According to Dubicki (2013), this is achieved by developing a viable ILS curriculum that could help train ILS competencies to students.

5.1 Adequacy of the ILS policy and curriculum in place

The interviewed respondents rated the adequacy of the ILS policy and curriculum in addressing ILS training and learning among medical students. Two university librarians, six heads of departments, and two heads of medical librarians responded. Of the ten respondents interviewed, 2 (20%) stated that the ILS policy adequately addressed the training and learning of ILS among students. While 8 (80%) of the interviewed respondents stated that the ILS policy and curriculum in place were inadequate in addressing ILS training and learning needs among students because it does not state who is responsible for ILS training, timeframes for reviews and updates are not indicated, assessments and reviews have never been carried out and the policy updated to reflect changes in the information environment. Furthermore, ILS training is never timetabled and is carried out at the convenience of the librarian and the lecturers, and the requisite facilities for ILS instruction are not available/provided

5.2 Methods of ILS curriculum delivery

Furthermore, the study sought to establish the methods used in delivering the ILS curriculum to medical undergraduate students. The findings are shown in Tables 3 and 4 for the students and lecturers.

Table 3: Students' response to methods of ILS delivery (N=255)

Methods of ILS delivery	SD		D		N		A		SA		Total			
	f	%	f	%	f	%	f	%	f	%	f	%	Mean	sd
Computers	12	4.7	10	3.92	9	3.5	172	67	52	20.39	255	100	3.95	3.53
Face to face teaching	3	1.2	13	5.09	5	2	186	73	48	18.82	255	100	4.03	3.57
Online materials	4	1.6	8	3.13	2	0.8	192	75	49	19.21	255	100	4.07	3.60
Handouts	15	5.9	10	3.92	17	6.7	175	69	38	14.9	255	100	3.83	3.42
Library orientation	19	7.5	22	8.67	24	9.4	156	61	34	13.33	255	100	3.64	3.28
WhatsApp group engagements	31	12	21	8.23	9	3.5	142	56	52	20.39	255	100	3.64	3.34
Peer training	33	13	15	5.88	10	3.9	124	49	73	28.62	255	100	3.74	3.45
Pre-recorded audio-video clips	12	4.7	10	3.92	18	7.1	146	57	69	27.05	255	100	3.98	3.58
Weekly librarian -student engagements	8	3.1	7	2.74	11	4.3	169	66	60	23.52	255	100	4.04	3.60

As shown in Table 3, the findings revealed that the majority of the students, 224(87.84%), 234(91.76%), 241(94.50%), 190(74.50%) and 241(94.50%) agreed that the use of computers face to face teaching, handouts given to students, library orientation, and online materials were used to impart ILS among medical undergraduate students in that order. However, 22(8.62%), 16(6.25%), 12(4.69%), 25(9.80%) and 31(12.15%) of the respondents disagreed that computers, face-to-face methods, online materials, handouts, and library orientation were teaching methods used to impart ILS among medical undergraduate students respectively.

Furthermore, the study revealed that 194(76.07%), 197(77.25%), 215(84.31%) and 229(89.80%) of respondents stated that WhatsApp group engagements, peer training, Pre-recorded audio-visual video clips and weekly librarian-student engagements/discourse were used as methods of ILS delivery respectively. There were 52(20.38%), 48(18.82%), 22(8.62%) and 15(5.87%) respondents who disagreed that WhatsApp group engagements, peer training, Pre-recorded audio-visual video clips and weekly librarian-student engagements/discourse were used as methods of ILS delivery respectively.

Table 4: Lecturers' response on methods of ILS delivery (N=62)

Statement	SD		D		N		A		SA					
	f	%	f	%	f	%	f	%	f	%	f	%	Mean	sd
Computers	1	1.61	1	1.61	2	3.23	51	82.26	7	11.29	62	100	3.99	3.51
Face to face teaching	1	1.61	2	3.23	4	6.45	44	70.97	11	17.74	62	100	3.98	3.52
Online materials	4	6.45	3	4.84	5	8.06	39	62.90	11	17.74	62	100	3.80	3.41
Handouts	2	3.23	1	1.61	1	1.61	48	77.42	10	16.13	62	100	3.97	3.52
Library orientation	1	1.61	1	1.61	2	3.23	53	85.48	5	8.06	62	100	3.95	3.46
WhatsApp group engagements	6	9.68	8	12.90	6	9.68	35	56.45	7	11.29	62	100	3.50	3.17
Peer training	9	14.52	5	8.06	3	4.84	31	50.00	14	22.58	62	100	3.60	3.33
Pre-recorded audio-video clips	2	3.23	6	9.68	5	8.06	40	64.52	9	14.52	62	100	3.76	3.35
Weekly librarian -student engagements	1	1.61	1	1.61	5	8.06	35	56.45	20	32.26	62	100	4.15	3.69

As shown in Table 4, a significant proportion of the lecturers, 58(93.55%), 55(88.70%) and 50(80.65%), agreed that computers, face-to-face learning, and online materials were methods of ILS delivery to students correspondingly. On the contrary, 2 (3.23%), 3 (4.84%), and 4 (6.45%) respondents disagreed that computers, face-to-face learning and online materials were methods used in delivering ILS to medical undergraduate students in that order.

Correspondingly, 58 (93.55%), 58(93.55%), 42 (67.74), 46 (74.20%), 49 (79.03%) and 55 (88.71%) of the lecturers agreed that handouts, library orientation, WhatsApp group engagements, peer training, weekly librarian-student engagements/discourse and pre-recorded audio-visual video clips were used to impart ILS to undergraduate medical students respectively. Whereas 1 (1.61%), 2 (3.23%), 6 (9.68%), 3 (4.84%), 5 (8.06%) and 5 (8.06%) of the respondents were undecided that handouts, library orientation, WhatsApp

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group engagements, peer training, weekly librarian-student engagements/discourse and pre-recorded audio-visual video clips were utilised for training used to train ILS to medical undergraduate students.

The verbatim findings also gave similar responses, summarised in the words of two respondents: a university Librarian (UL 02) and a head of the department (HD05).

According to the sentiments of the university librarian (UL 02) from one of the universities had this to say:

"We utilise peer training through knowledge ambassadors among the students…. I also have a program known as librarian-student weekly engagement where we discuss issues on library information material access and use and find out the challenges they face in retrieving and using the information."

One head of department (HD05) reverberated:

"Professionals involved in ILS teaching employ several tools to teach these important skills; the methods include, among other methods, online classes, pre-recorded audio-visual videos prepared by the library personnel, formation of social media groups where the department engage positively with students on issues concerning access to information materials, originality in clinical writings, usage of information. We also have face-to-face engagements, giving handouts on information usage and search."

The findings agree with Bruce et al.'s (2006) study on information literacy training in Africa, which found that ILS instruction in higher education institutions has taken various forms: online tutorials, standalone courses or classes, workbooks, course-related instruction, or course-integrated instruction. In support of these findings, Ania's (2005) study on the most common methods adopted in ILS training found that the standard methods of delivering ILS are one-on-one sessions, library orientation, and formal or classroom instruction. Similarly, in Baro and Zuokemefa's (2011) study on Information literacy programs in Nigeria, a survey of 36 university libraries revealed that the standard methods of ILS delivery were face-to-face in the library training room and a venue external to the library. However, their study found limited online training because the libraries require adequate IT personnel skilled in using technology; facilities such as modern computers with Internet connectivity in some university libraries and unreliable power supply are absent.

5.3 Techniques for assessing the effectiveness of the ILS curriculum and policy

The study sought to learn about the assessment techniques used to determine the success of ILS curriculum instruction. Lecturers were asked to describe the assessment procedures they used to evaluate the efficiency of ILS curriculum instruction. The replies were similar, and they are summarised in Table 5.

Table 5: Techniques for assessing the effectiveness of the ILS curriculum

Respondents	Responses from the questionnaire
LT11	Practical research writing; creative clinical presentations
LT23	ILS feedback forms
LT36	Focus groups, interviews
LT 41	Knowledge tests
LT55	Informal assessment techniques
LT57	On-the-spot assessment
LT 59	Pre-assessment using CATs,
LT60	Examination for those trained in Communication Skills classes
LT62	Continuous assessment tests

The verbatim findings affirmed that several methods are employed to assess the effectiveness of the ILS curriculum. Heads of departments, heads of medical librarians, and university librarians agreed that

numerous methods were employed, such as focus groups, on-the-spot assessment concept maps, CATs, information assessment techniques, interviewing, knowledge tests through creative clinical and research papers, and ILS feedback forms. One University Librarian (UL01) said:

> *"Librarians use concept maps more frequently because they provide unique opportunities to assist students in integrating new concepts…they are appropriate as a pre-test and post-test for students and therefore work best in assessing course-integrated information literacy instruction and standalone information literacy courses like communication skills."*

Further, one head medical librarian (ML02) interviewed said:

> *"Our institution uses the focus groups, concept maps and CATs to assess the ILS of our medical students."*

6 Conclusion

The findings suggest that the institutions have ILS curriculum and policies championed by university librarians and cover ILS content that includes information skills, problem-solving and critical thinking, communication skills, information technology skills, social responsibility skills, referencing and legal issues in information. However, the study revealed that the ILS policy and curriculum have never been reviewed or updated; implementation of the ILS policy and curriculum has not been done as required because no responsibility was attached; the policy did not provide for the amount of training time required and requisite facilities for information literacy skills instruction, as illustrated in figure 4.

7 Recommendation

The study found that standardised information literacy skills programs were not provided in the universities under study, demonstrating a lack of harmonised ILS programs. Therefore, the study strongly recommends establishing four ILS credit-scored units that should be separated from the communication and writing skills course unit and take the same contact hours as other units at the universities. In addition, these units should have a practical orientation, with 70% practical and 30% theory.

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RESPONSIVE INFORMATION SERVICE AND PRODUCTS

22. Using the Scholarly Communication Service to Enhance Research Support to UKZN Academics

Nonhlanhla Ngcobo
University of KwaZulu-Natal
ngcobon15@ukzn.ac.za

Abstract

Twenty-first-century librarianship is marked by a shift from curation of material to research support roles. This calls for acquiring research-oriented skills in the research field, such as Research Data Management (RDM) and Open Access (OA). Libraries are transitioning from a collection-based model to a more broadly services-based model, which requires a significant change in the kind of support libraries provide to their users. Scholarly communication is a growing area of interest in academic librarianship. Scholarly communication is the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use. Scholarly communication is, in part, the process through which scholars and researchers communicate the results of research or other creative endeavours to their peers, formally or informally. This process typically includes publishing books or articles in peer-reviewed journals, papers in conference proceedings, pre-prints, white papers and posters. Scholarly communication is depicted as a five-stage lifecycle that documents the steps in creating, publishing, disseminating, and discovering scholarly research. Several stakeholders are involved in various stages of the scholarly communication lifecycle, such as researchers, funders, peer-reviewers, publishers and libraries. This paper describes the advanced research support that the University of KwaZulu-Natal Library Services provides its researchers, which aligns with the five steps of the scholarly communication lifecycle.

Keywords: *Information services, responsive information services, changing LIS roles, personal librarians, personal librarianship*

1 Introduction

The University of KwaZulu-Natal (UKZN) is a multi-campus university in the two cities of Durban and Pietermaritzburg. It boasts a student population of 47,000. Nine thousand seven hundred are postgraduate students and an academic staff complement of 1,300. UKZN is a research-led and research-productive university, which means that all academic staff are expected to be engaged with research in addition to teaching. All academics are expected to be 'research active', which embraces publishing research outputs, raising external research funding, and supervising postgraduate students continuously. These expectations can be daunting in the context of other expectations related to teaching excellence and service commitments. It must be noted that academics are not expected to do their research without support. The five departments that comprise the Research Division, viz, the Research Office (RO), Incubate, UKZN Press, Research Financial Services and the Library, work in unison to provide an array of support and services for all active researchers. These include support for research integrity and guidance on ethical research; assistance with the selection of funding agencies; support of proposal writing, budgeting and approval; advice and support with intellectual property protection and exploitation; assistance with grant finance management and administration; and library collections and services to support the needs of researchers. The Universities South Africa Strategic Framework 2020 to 2026 asserts that universities are powerful bridges between South Africa's knowledge system and the cultural, social, political and economic spheres. From a policy point of view, the primary role of universities is to prepare students for the workforce and to produce knowledge.

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A tour of South African universities' websites and universities nationally and globally indicates that universities are known for the proud and rich heritage of academic excellence to which they universities aspire. This vast wealth of knowledge production lies at the heart of what these institutions are known for. Research is essential to advancing society, strengthening the economy, driving innovation, and addressing society's vexing and challenging problems.

Research aims to produce and disseminate knowledge that will improve the quality of life and shape public thought (Houghton, 2001). Research support services are responsible for several services supporting the university's researchers and the research endeavour. These include supporting evaluation applications and funding proposals to the National Research Foundation, servicing research funding and strategic committees, and meeting statutory reporting requirements to the government, such as submitting research output data to the Department of Higher Education and Training.

There is research support for early career academics or those who have not yet established themselves as researchers. It includes a wide range of professional development seminars and workshops open to all staff and research development grants for eligible early career staff. The grants are dependent on funding and limited to staff who meet specific criteria, which include being on academic conditions of service and being an active participant in the researcher development initiatives of the Research Office.

Early career academics are assisted with planning their research careers so that they can achieve the various milestones necessary to advance in a research-intensive university—a doctoral degree, accredited (subsidy-earning) research outputs (such as articles, books, patents, and creative productions), successful grant proposals, postgraduate supervision, and NRF rating.

2 Literature review

The need to maximise research support is evident in the literature (Ocholla & Ocholla, 2020; Thomas, 2013). The "publish or perish" phenomenon has highlighted the importance of research productivity among academics/researchers, especially in research-intensive academic environments. The mandate to produce new research demands a corresponding action from academic librarians to provide relevant and timely support to researchers. Personal librarian services effectively maximise academic research support (Wegner & Zemsky, 2007). This paper adds to the growing body of knowledge in the literature that covers this topic, especially in the South African context, where a scarcity in the literature was identified.

3 Method of research support

Effective twenty-first-century librarianship requires a major paradigm shift in the packaging and delivery of library services to suit current information needs and demands. The Scholarly Communication Service is the ideal model for the effective and efficient provision and delivery of relevant and up-to-date information services. Figure 1 below documents the steps in creating, publishing, disseminating and discovering scholarly research.

Figure 1: The scholarly communication lifecycle Source: https://acrl.libguides.com/ scholcomm/toolkit

Advanced research support in each stage of the scholarly lifecycle effectively entrenches the library in the heart of research and positions the library as a critical role player in the research process. The adoption of the Scholarly Communication Service model at UKZN Library Services is discussed to highlight the innovative ways the UKZN Library Services provides responsive information services and products to support UKZN's research objectives.

This lifecycle marks the transition of libraries from their traditional role of collecting and organising scholarly information for retrieval by users to being prominent actors and information producers in the scholarly communication lifecycle. This is achieved mainly by assisting researchers to maximise the impact of their research by supporting systems of researcher identification and promoting the use of altmetrics.

To function effectively in this new role, the twenty-first librarian must acquire the skills, knowledge, and competencies that this new role demands. Librarians need to diversify into dedicated and in-depth research support to sustain relevance. This can be achieved through greater involvement in the scholarly communication lifecycle by providing expert research support and training in scoping reviews. This makes the librarian an active participant in knowledge production with the researcher. According to Klain-Gabbay and Shoham (2016), the study of scholarly communication addresses the information needs of individual scholars and scholarly groups.

Guided by the university's pursuit of research excellence and relevance, UKZN Library Services supports researchers at each stage of the research lifecycle. Particular focus areas include ensuring access to the best possible academic sources, facilitating scholarly communication, and promoting research output. The library also provides conducive spaces for research and efficient service delivery by experienced staff.

Active participation in each stage of the scholarly communication lifecycle is no longer a matter of preference but an imperative if the library is serious about maintaining its relevance to the university

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community. Consequently, UKZN Library Services adopted personal librarianship to maximise research support. This pilot project started in June 2022 with one Executive, and it has since grown to include 25 academics with 15 personal librarians service. The pilot project entails assigning a personal librarian to individual academics, and the personal librarian's role is to provide advanced research support to that academic in each of the five stages of the scholarly communication lifecycle.

Table 1 below shows the number of Personal Librarians assigned to academics/researchers, the departments they are affiliated with, and the nature of their activities.

Table 1: Personal Librarians and their academics

School	Personal Librarian
DVC: Research and Innovation	PL 1
DVC: College of Humanities	PL 2
DVC: College of Health Sciences College Dean of Research: Health Sciences	PL 3
Dean of Research: College of Humanities	PL 4
Dean and Head of School: Management, IT and Governance - College of Law and Management School of Applied Human Sciences Dean of the School of Applied Human Sciences	PL 5
Dean School of Accounting, Economics and Finance	PL 6
Medical School/CAPRISA School of Lab Medicine and Medical Science	PL 7
Medical School/CAPRISA School of Clinical Medicine	PL 8
Public Governance, School of Management, Information Technology and Governance Social Work Human Resource Management School of Social Sciences School of Social Sciences	PL 9
Graduate School of Business and Leadership	PL 10
UKZN Press	PL 11
School of Engineering	PL 12
Executive Director: Student Services	PL 13
College Dean of Research: A, E and S	PL14
Acting College Dean of Research: Law and Management Studies	PL 15

4 Personal librarians and researcher engagements

Engagements with researchers take place regularly. Although the frequency of meetings heavily depends on the availability of researchers, every effort is made to meet monthly. It is worth noting that the frequency is also affected by the researcher's activities. For example, the frequency of the meetings increases when the researcher is engaged in a particular project, such as submitting his or her research output to the National Research Foundation for an NRF rating.

Personal librarians schedule academic meetings using their assistants. The engagements generally take the form of face-to-face meetings in the academics' offices. In the initial meetings, the rules of engagement, such as communication and meeting frequency, are agreed upon. The mode of communication and the frequency of meetings vary from academic to academic, as the individual academic's preference determines these.

Emails are the most common mode of communication between the two parties, followed by WhatsApp and texting (SMS).

5 Activities of personal librarians and researchers

The meetings aim to fully understand the research activities of the researcher, i.e., their research interests, the journals they prefer to publish in, their H-index from different sources, and their NRF rating. The personal librarian does background work on the researcher in preparation for the first meeting by capturing the information in a researcher profile, using existing information sources. The researcher then populates the researcher profile with any information that could not be obtained from available sources. Table 2 below shows the nature of the information used to compile a researcher profile.

Table 2: Researcher profile template

Date of profile	
Name & Surname	
Title	
Discipline, School and College	
Office phone number	
Email address	
Orcid	
Teaching course(s)/Modules	
Areas of student supervision	
Professional interests	
Research area/s	
Current specific research projects	
Open Access activity	
Preferred journals for publishing	
H-Index (Scopus)	
Web of Science H index	
Google Scholar H-Index	
ResearchGate activities	
NRF Research rating	
Notes:	

Other activities include creating RSS feeds and alerts specifically on Scopus and Web of Science for the research areas requested by the academics; merging accounts in different sources for a more reflective account on both Scopus and Web of Science; creating visibility for the academic in different platforms, such as Research Gate, Scopus, Google Scholar; updating profiles; and gathering information for the NRF rating.

6 Discussion

Advanced research support in each stage of the scholarly communication lifecycle is provided as follows:

In the Research, Data Collection and Analysis stage, assistance includes holding research/book cycle workshops to provide support to the research from the inception of the idea to the publication of the research paper or book, in partnership with UKZN Press; research interviews, topic analysis and identifying

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relevant sources; information retrieval skills – creating alerts from subscribed databased and Open Access platforms; conducting literature reviews, systematic and scoping reviews, document delivery services, such as Pay-Per-View, Inter-Library Loans & Inter-campus loans; use of referencing tools and harvesting full-text articles; and providing access to up-to-date collections, the institutional repository, Yabelana and Research Commons.

In the Authoring stage, academics are assisted with setting up profiles for ORCID, Google Scholar, and Publons to track individual impact and consistently identify research outputs; establishing collaborations with researchers in the same field and identifying co-authors using scoping reviews; imparting knowledge of similarity indexes and plagiarism software; advice on different Open Access models and grant opportunities; expert training on various aspects of publishing, publisher sites, bogs, webinars that assist in publishing; and access to guides on authorship, subject LibGuides.

In the Peer review stage, researchers are assisted with retrieving and identifying accredited journals in the relevant field, e.g., the Department of Higher Education List of Accredited Journals, identifying predatory journals and access to citation and publication matrix, e.g., H-index.

With regard to publication, researchers are provided with knowledge of publishing platforms (open access and subscription journals available nationally and internationally), UKZN University Press services, copyright, publishing process and options, self-archiving, and distributing the scholarly output.

In the discovery and dissemination stage, researchers are informed about publishing platforms (Open-Access and subscription journals) available nationally and internationally.

These services are also provided to academics, in addition to supporting each stage of the scholarly communication lifecycle, as part of the provision of advanced research support:

- Access to up-to-date information sources, including information sources not available at UKZN – Pay-Per-View & Inter Library Loans.
- Access to information required for grant applications, such as accessing H-Index using specialised databases such as Scopus, Google Scholar and SciVal.
- Advanced training in using the various databases and becoming independent in searching for information sources, creating alerts, citations and referencing.
- A network of collaborators and grant opportunities in the specific subject field using specialised databases such as the Web of Science, SciVal, and Scopus.
- Retrieve discipline-specific research output by comparing similar research between other universities nationally and internationally.
- Support throughout the research cycle (from developing the concept to publication) through using relevant databases and keyword selection/searching terms).
- The Research Commons provides technical and informational support; relevant academic software (NVIVO, Endnote, GlobalProtect) can be downloaded there.
- Uploading of research output on ResearchSpace and Yabelana for enhanced visibility and accessibility.
- Identify and select credible Open-Access journals and publishing platforms, such as Open Journals Systems-UKZN.
- Communication of scientific research.
- Use research tools to identify related research areas of the School or Department and multidisciplinary areas to attain an overall view of the research activities.
- Knowledge of the journals to publish in and journal ranking.

- Use research tools and resources such as Scival, Scopus, National Research Foundation (NRF), UKZN Research Office Annual Report, and Research Information Gateway (RIG) to access various reports on recent research output, collaborations, and comparisons of similar research in the subject areas with other South African higher education institutions.

Advanced research support is also provided to young/emerging research through these services: discipline-specific training; knowledge on how to identify credible journals and publishing platforms, e.g., Open Journals Systems; creation of researcher profiles; use of ResearchSpace and Yabelana to increase visibility and accessibility; and any other services they require to stimulate research output.

7 Conclusion

UKZN prides itself on being a top research-productive university in South Africa, and this calls for UKZN academics to prioritise research production in their endeavours, in line with Goal 3 of the University's Strategic Plan of Pre-eminence in research, which enables the university to be a pre-eminent producer of new knowledge that is both local and global in context. Undoubtedly, research production requires the availability of critical collections and information-literate researchers with the requisite skills to access and retrieve the information needed to produce research. The adoption of the scholarly communication service, which incorporates the provision of personal librarian services, at the University of KwaZulu-Natal Library Services aims to address this need precisely.

The implementation of the scholarly communication service, with the host of services it entails, especially the adoption of personal librarian services, is a testament to the library's commitment to the increase in the production, visibility and accessibility of research produced at UKZN. The personal librarian model is a radical departure from the traditional model of assigning librarians to disciplines to the more efficient model of assigning them to disciplines. This ensures that adequate research support is provided to each academic to enhance research productivity. The University Executive's endorsement of this model indicates the great trust the Executive has put in the library. The library's massive support from the University Executive contributed immensely to the pilot project's success.

The scholarly communication service has redefined the provision of library information services in every respect. It is no longer "business as usual" regarding how librarians function, but with proper implementation, monitoring and evaluation, effective and efficient functioning in the scholarly communication arena will soon become "the new normal".

8 Recommendations

The uptake of this service by the academics and researchers at UKZN has been phenomenal. It has received positive comments from stakeholders, but formal feedback needs to be solicited through a survey. The survey will be conducted when the pilot project is completed before the end of 2024.

The impact of this service is yet to be ascertained. Since the scholarly communication service, which includes personalised librarian services, is aimed at increasing the production, visibility and access to research produced at UKZN, its impact will be measured in terms of increased research, visibility and accessibility. Statistical data from the Department of Higher Education, the NRF and the Research Office will be analysed annually over three to five years to see if research production, visibility and accessibility have increased. It must be noted that increased research productivity is directly linked to increased government subsidies. Therefore, the potential value of this service is great.

The library must invest in the training and reskilling librarians to make them scholarly communication-literate. It would be unrealistic and counter-productive to expect librarians to function efficiently in this

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new model library information services provision without the necessary training. Several entities, such as LIASA (Library and Information Association of South Africa), service providers and skilled LIS practitioners, provide training in various aspects of librarianship. These entities will be optimally utilised to equip librarians to function in the scholarly communication space with expertise and ease.

This paradigm shift in the library service provision of assigning librarians to academics rather than to disciplines, as per the previous prevailing practice, carries several implications. It demands an increase in the number of librarians employed to cover all academics, increasing the human resources budget. To mitigate the financial implications of implementing the scholarly communication service, the library did a skills audit of its employees. The results showed that some employees are employed in paraprofessional positions but have library qualifications. These employees will receive coaching and mentoring so that they are also able to provide personalised librarian services.

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23. A Bibliometric Analysis of Academic Writing and Scholarly Communication in Sub-Saharan African Institutions of Higher Learning

Augustine Gitonga*; Peter Gatiti**

Aga Khan University

*augustine.gitonga@aku.edu; **peter.gatiti@aku.edu

Abstract

The academic landscape in Africa is witnessing rapid change driven by technological advancements and the increasing demand for globally competitive research output. Libraries and librarians, as crucial stakeholders in the academic ecosystem, are adapting their roles to meet the diverse needs of researchers and scholars across the continent. This paper is a bibliometric analysis of the contribution of African researchers to academic writing, the library's role in scholarly communication and the areas of impact that academic publications contribute to scholarship. A citation analysis of how highly the publications are cited or mentioned on various platforms is conducted, and the h-index is given. The paper contributes to scholarship by identifying academic writing as a critical skill in higher education. It calls on Sub-Saharan countries and universities to establish writing centres to advance scholarly communication and increase academic publication. Faculty, students and researchers are encouraged to write better, write more and publish more to improve their scholarly standing.

Keywords: *Altmetrics, information literacy, librarian roles, open access, scholarly publication*

1 Introduction

The academic landscape in Africa is marked by a growing emphasis on research and scholarly output, fueled by increasing investment in education and research infrastructure. Like all other scholars worldwide, sub-Saharan African researchers are expected to find and access information resources and write, publish, and disseminate information widely to impact and influence their world and gain scientific recognition and tenure (Malapela, 2017). However, sub-Saharan African researchers face numerous challenges, including limited access to resources, language barriers, and publishing constraints (Adakawa, 2022). In this context, libraries and librarians play an increasingly important role in supporting academic writing and scholarly communication (Siyao et al., 2017).

2 Literature review

The evolution of scholarly communication is characterised by the emergence of open-access initiatives, the proliferation of digital repositories, advancement in research data management practices, and the growing adoption of alternative metrics (Malapela, 2017). These developments offer opportunities for African researchers to enhance the accessibility, visibility, and impact of their work, thereby contributing to the advancement of knowledge both locally and globally (Mwelwa et al., 2020). However, despite increased access to information resources and technology, scholarly publishing is still low in sub-Saharan Africa. The pressure is mounting on academics to "publish or perish" (Mbewe et al., 2019). This bibliometric analysis evaluates the impact of articles published on academic writing and scholarly communication in sub-Saharan Africa. It analyses publications by authors affiliated with institutions in Sub-Saharan Africa, indexed in Scopus, a citation database of peer-reviewed literature.

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3 Methodology

Researchers use Web of Science, Scopus and Google Scholar data to assess scholarly communication (Hammarfelt, 2014). This study opted for Scopus with over 15,000 journal titles. The analysis uses scientometrics methods to demonstrate trends and identify the most effective articles, journals, and collaborations between institutions. Data were extracted from the Scopus citation database using advanced search, where various scientific disciplines were categorised based on the journals' fields of specialisation. The category identified for analysis was "academic writing" within English language documents. The countries of affiliation were all sub-Saharan African countries (given as addendum) and were limited to the last ten years for comprehensiveness and updatedness of data collection. The results were extracted and transferred to MS Excel for interpretation, graphical representation and presentation.

4 Results

The findings of this study are presented here according to the main themes including contributions towards academic writing in Africa, annual distribution of articles, distribution of articles per subject, top journals publishing academic writing articles, Sub-Sahara African affiliated research institutions, citation analysis, documents by territory of research, and altmetric analysis.

4.1 Contributions towards academic writing in Africa

Five hundred and twenty (520) documents published in English by authors affiliated with sub-Saharan African countries were identified. As shown in Figure 1, the publications included 411 original research journal articles (79.3%), 25 review articles (4.9%), 47 book chapters (8.8%), 18 books (3.4%) and 19 conference papers (3.6%). Excluded were letters, editorials, notes and data papers.
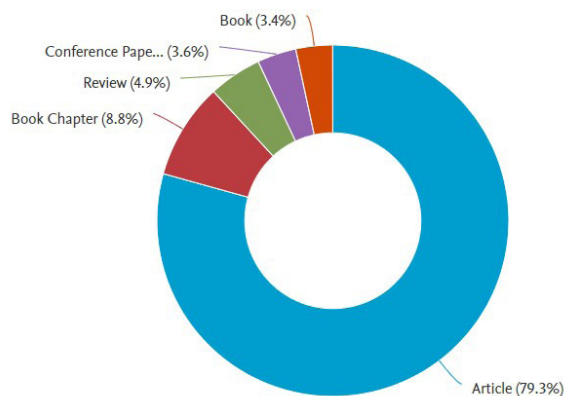
Figure 1: Types of publications

4.2 Annual distribution of articles

The annual article distribution indicates a consistent growth in interest in academic writing scholarship, only temporarily dented by COVID-19 between 2020-2022 when publications sunk to lower than 70 in 2019. There had been a meagre slip in 2018 when 44 documents were published, four fewer than the 48 in 2017, but in 2019 the publications almost doubled to 70. After COVID-19, the recovery has been exponential, rising to a high of 97 documents in 2023 (Figure 2).
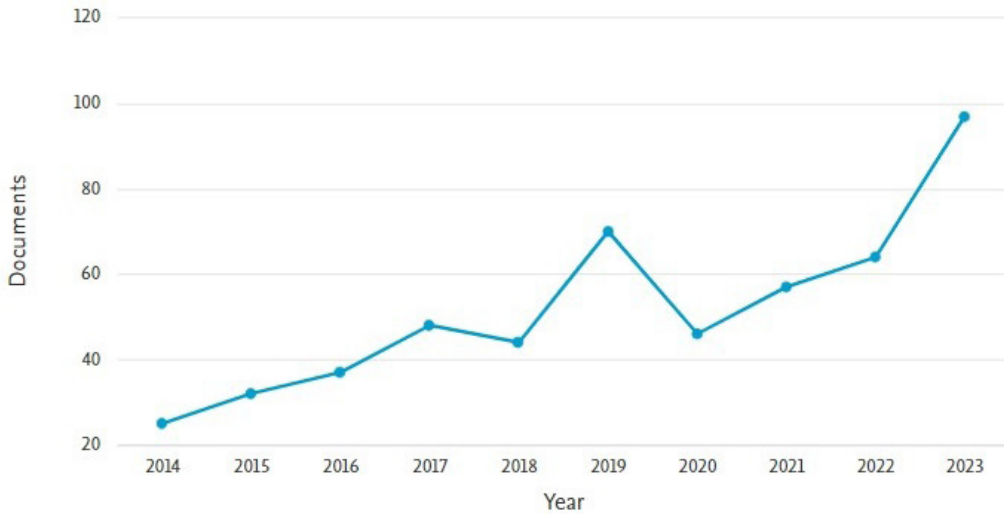
Figure 2: Number of publications per year, 2014 - 2023

4.3 Distribution per subject

Academic writing is discussed in various fields of study. It is mostly discussed in the social sciences, with 390 publications in the ten years, followed by 151 publications in the arts and humanities. Medicine, being a research and publication-rich field, comes third with 55 publications; the health field combined to include nursing and other allied professions adds 24 more publications to reach 79. There is an overlay of subject areas in different publications, and therefore, the total number of documents exceeds 520 publications, yet the percentage adds up to a hundred, as shown in Table 1 below.

Table 1: Documents by subject area

Subject area	Documents	Percentage
Social Sciences	390	47.2%
Arts and Humanities	151	18.3%
Medicine	55	6.7%
Business, Management and Accounting	42	5.1%
Computer Science	36	4.4%
Psychology	28	3.4%
Economics, Econometrics and Finance	26	3.1%
Engineering	23	2.8%
Others		9.0%

4.4 Top journals publishing academic writing articles

As indicated in Table 2, the *Library Philosophy and Practice* journal leads the pack with 12 articles. Educational and linguistics journals follow closely, with *Perspectives in Education* having 11 articles; *Stellenbosch Papers in Linguistics Plus*, 10 articles; *Critical Studies in Teaching and Learning*; and *HTS Teologiese Studies / Theological Studies* tying at 8 articles. *BMJ Global Health* is the health/medical journal with the most academic writing articles at 7. Nine journals have four articles each; 12 journals have three articles each; 47 have two articles, and the bulk of the journals (191) have published only one article over the ten years.

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Table 2: Top 10 journals with academic writing articles

Source	Documents
Library Philosophy and Practice	12
Perspectives in Education	11
Stellenbosch Papers in Linguistics Plus	10
Critical Studies in Teaching and Learning	8
Hts Teologiese Studies Theological Studies	8
BMJ Global Health	7
Southern African Linguistics and Applied Language Studies	7
Higher Education Research and Development	6
Education As Change	5
Journal of Language Teaching and Research	5

4.5 Sub-Sahara African affiliated research institutions

South African universities have the highest academic writing publication output in the continent, taking the first 12 positions and having 19 institutions among the top 30 or 66.6% (Figure 3). The University of Cape Town leads with 54 publications or 10.4%, followed by the University of Pretoria with 41 or 7.9% and the University of the Witwatersrand, Johannesburg, with 39 publications or 7.5%. Some of the non-South African universities among the top 30 are the University of Cape Coast Ghana, with 10 academic writing publications; the University of Ghana and the University of Nigeria, both with 8; the University of Botswana and Bahir Dar University (Ethiopia), both with 6; and Obafemi Awolowo University (Nigeria), Addis Ababa University (Ethiopia) and Makerere University (Uganda), each with 5 publications.
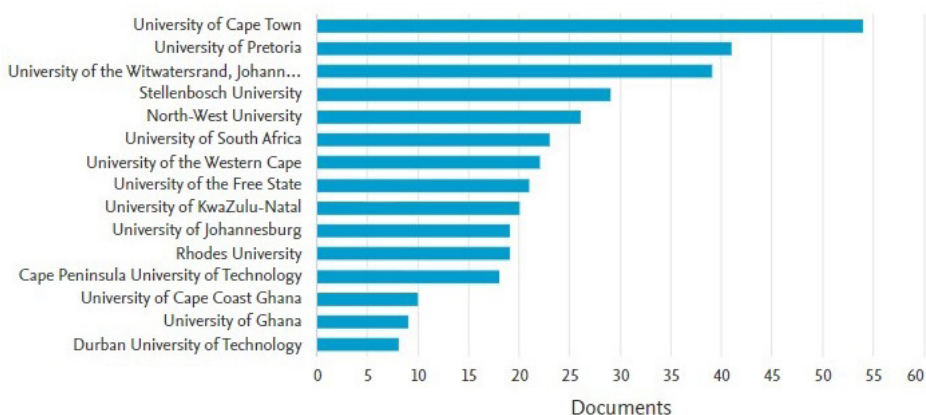
Figure 3: Top 15 Sub-Saharan African universities with academic writing publications

4.6 Citation analysis

Table 4 presents the top ten cited academic writing publications from Africa-centric authorship and sources. A book on academic writing has been cited the most in 171 documents; a health journal article has been cited in 134 documents; and an article in a conference proceeding has been cited in 80 documents. The relevant Sustainable Development Goals (SDGs) for various articles are also identified, indicating how academic writing publications have a societal and professional impact.

Table 4: Top 10 cited academic writing publications

Authors	Title	Year	Source	No. of citations	Altmetrics	SDGs 2030
Gordon L.R.	What Fanon said: A philosophical introduction to his life and thought	2015	Book	171	33 Captures 7 Mentions	Peace, justice and strong institutions **Goal 16**
Hedt-Gauthier B.L.; Jeufack H.M.; Neufeld N.H.; Alem A.; Sauer S.; Odhiambo J; Boum Y.; Shuchman M.; Volmink J.	Stuck in the middle: A systematic review of authorship in collaborative health research in Africa, 2014-2016	2019	BMJ Global Health	134	*Policy Citations 2* Captures 160 Mentions 15 Social Media 118	Partnership for the goals **Goal 17**
Chapman C.A.; Bicca-Marques J.C.; Calvignac-Spencer S.; Fan P.; Fashing P.J.; Gogarten J.; Guo S.; Hemingway C.A.; Leendertz F.; Li B.; Matsuda I.; Hou R.; Serio-Silva J.C.; Stenseth N.C.	Games academics play and their consequences: How authorship, h-index and journal impact factors are shaping the future of academia	2019	Proceedings of the Royal Society B: Biological Sciences	80	348 Captures 8 Mentions 1,798 Social Media	
Morton B; Vercueil A; Masekela R.; Heinz E.; Reimer L.; Saleh S; Kalinga C.; Seekles M.; Biccard B; Chakaya J.; Abimbola S.; Obasi A.; Oriyo N.	Consensus statement on measures to promote equitable authorship in the publication of research from international partnerships	2022	Anaesthesia	79	*Policy Citation 1* 129 Captures 2 Mentions	Reduced inequalities **Goal 10** Partnership for the goals **Goal 17**
Azzam A.; Bresler D; Leon A.; Maggio L.; Whitaker E.; Heilman J.; Orlowitz J.; Swisher V.; Rasberry L.; Otoide K.; Trotter F; Ross W.; Mccue J.D.	Why medical schools should embrace Wikipedia: Final-year medical student contributions to Wikipedia Articles for Academic Credit at One School	2017	Academic Medicine	69	69 Citations 116 Captures 10 Mentions	Quality education **Goal 4** Partnership for the goals **Goal 17**
Gautier L.; Sieleunou I.; Kalolo A.	Deconstructing the notion of "global health research partnerships" across Northern and African contexts	2018	BMC Medical Ethics	67	67 Citations 137 Captures 5 Mentions	
McGladdery C.A.; Lubbe B.A.	Rethinking educational tourism: proposing a new model and future directions	2017	Tourism Review	51	51 Citations 195 Captures 2 Mentions	
Kumwenda S.; Niang E.H.A.; Orondo P.W.; William P; Oyinlola L.; Bongo G.N.; Chiwona B.	Challenges facing young African scientists in their research careers: A qualitative exploratory study	2017	Malawi Medical Journal	49	49 Citations *Policy Citation 5* 154 Captures	Quality education **Goal 4** Partnership for the goals **Goal 17**
Pienaar A.E.; Barhorst R.; Twisk J.W.R.	Relationships between academic performance, SES school type and perceptual-motor skills in first grade South African learners: NW-CHILD study	2014	Child: Care, Health and Development	48	48 Citations 223 Captures	Quality education **Goal 4** Partnership for the goals **Goal 17**
Opoku-Acheampong A; Kretchy I.A.; Acheampong F; Afrane B.A., Ashong S.; Tamakloe B; Nyarko A.K.	Perceived stress and quality of life of pharmacy students in University of Ghana	2017	BMC Research Notes	47	47 Citations 164 Captures	

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4.7 Documents by territory of research

Researchers on Africa-centric academic writing knowledge are distributed globally, as shown in Figure 4. South Africa-affiliated authors have 347 documents out of the 520 publications, while Nigeria has 54, Ghana 32, Ethiopia 22, Kenya 22 and Tanzania 13. Researchers studying in sub-Saharan institutions but residing in other non-African countries are also represented, with the United States having 43 publications, the United Kingdom 34, Australia 15, Canada 15 and Finland 6. This distribution is because some authors are based in universities outside of sub-Saharan Africa but are writing on sub-Saharan African-based perspectives and institutions.
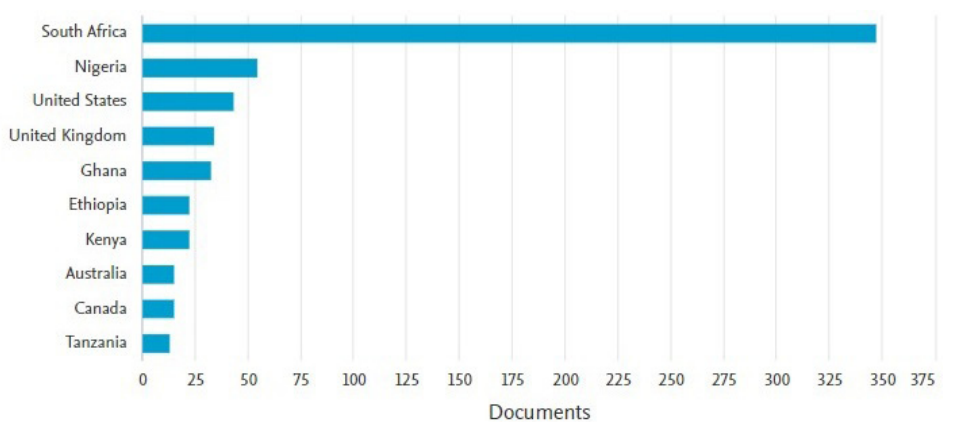
Figure 4: Documents by affiliated territory or country

4.8 Altmetric analysis

An altmetric citation analysis further shows the wide impact of the top ten articles. PlumX metrics help identify the areas where the publications have impacted, together with the citation details. Hammarfelt (2014) details how altmetrics help identify the publications that have impacted policy decision-making or the global SDGs and all the areas in which the publications have been mentioned, such as on social media, mainstream media, books and journal articles. Using Mendeley reader data, the top-cited article with the highest capture data has 348 downloads (the number of times a document has been added to a Mendeley library). The publication with the most mentions among the top ten publications is 15, and the highest on social media is 1,798 Facebook comments, likes, and shares. Three documents have influenced policies and have been cited in 8 policy documents.

Figure 5 shows the h-index, which measures the author or article's impact by averaging the number of articles cited against the highest number of citations. The academic writing publications have a h-index of 27, meaning that 27 publications have been cited at least 27 times.
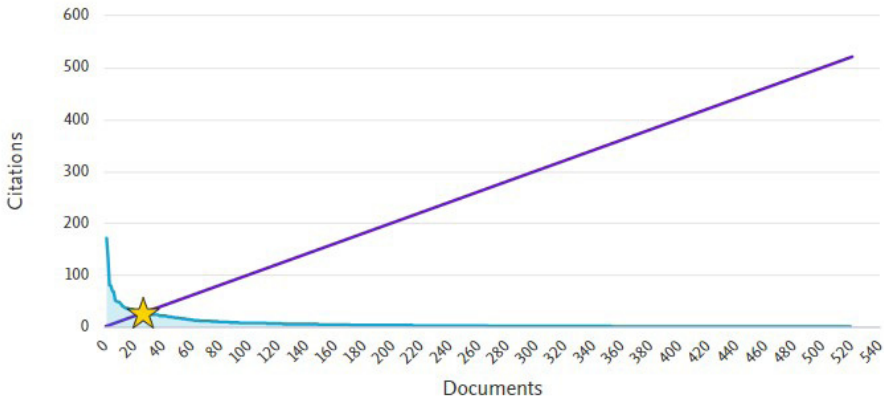
Figure 5: Academic writing publications' h-index

Bibliometric analysis of the keywords in academic writing publications was done by examining the co-occurrence of keywords used to select relevant articles for analysis (Figure 6). The keywords were grouped into three clusters. Cluster one comprised 'centre', 'higher education', 'role', and 'teaching'. Cluster 2 comprised 'COVID', 'development', and 'impact'. Finally, cluster 3 comprised 'academic writing' and 'postgraduate student'.
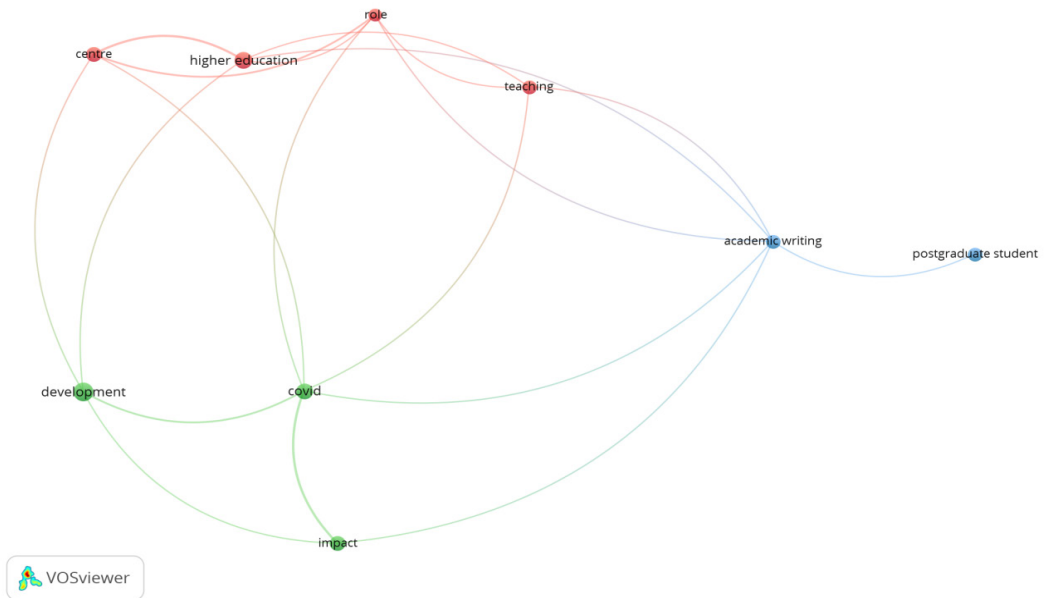
Figure 6: VOS Viewer of keywords

5 Discussions

Academic writing and scholarly communication are essential for faculty, students, and researchers globally. In sub-Saharan Africa, some attention is being paid to the discipline, and the growth in publication output in the field is exponential (Chapman et al., 2019). It was essential to develop an elaborate query with proper

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parameters to retrieve the correct data for analysis to establish the production of academic writing literature in sub-Saharan Africa and establish the impact the publications are having on the scholarly practice of the region. Much interest in increased discussion on this topic exists, and with each coming year, journal articles and new documents will continue to be published. Academic writing and scholarly communications are interdisciplinary skills, and journals across a wide spectrum of knowledge continue to publish different articles on the topics. Libraries are the strongholds of information literacy, inculcating research skills and assisting with searching, accessing, finding, and appropriately applying information (Åström & Hansson, 2013; Raju et al., 2015).

6 Conclusion

Bibliometrics is important for librarians. It helps check the impact of scholarship across various platforms. It is an area that information professionals should pursue, seek to understand, and even advance by coding new knowledge and information-tracking innovations. Librarians should seek to ensure that academic writing services are offered in their institutions of higher learning and research, and where possible, such a centre is hosted within or in the proximity of the library. An academic writing service or centre should be the highest outcome of an advanced information literacy programme.

Although rich and informative, this study was limited in that data was obtained from only one database, Scopus. While Scopus has a wide-ranging journal collection, other research databases would have added various resources, enriching the data and the study even further. Further research may be carried out on universities in sub-Saharan Africa that have established academic writing centres, identifying the cadre of staff engaged in them and their role. Levels of collaboration between academic writing professionals need to be sought.

7 Recommendations

This paper challenges librarians to undertake bibliometric analysis of pertinent topics to establish knowledge gaps and the impact of scientific publications. It also recommends increased academic writing and scholarly publishing among sub-Saharan African scholars to increase scholarly visibility and knowledge sharing.

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24. Attitude of Undergraduate Students Towards the use of E-Resources at Sokoine University of Agriculture, Tanzania

Ronald Benard*; Grace Msoffe**

Sokoine University of Agriculture
ronaldbenard75@gmail.com or berota@sua.ac.tz

**University of Dodoma*
grace.msofe@udom.ac.tz

Abstract

This study assessed undergraduate students' attitudes towards using electronic information resources. Specifically, the study determined the attitudes of undergraduate students towards the use of electronic information resources, find out the awareness of students about the available electronic resources, find out the frequency of using electronic resources, and find out the factors influencing students' usage of electronic information resources. A cross-sectional research design was adopted for this study. Purposive sampling and simple random sampling techniques were adopted to select the respondents. The study interviewed 297 respondents. The study found that age, year of study, and gender were the attitude predictors of students' usage of e-resources. It was found that age influenced the use of online databases statistically at a 1% significance level (p = 0.008). Students reported being aware of several e-resources, including e-books, online journals/databases and CD-ROMs. The least known e-resources were institutional repositories and e-discussions. It can plausibly be concluded that e-resources have become of immense importance in academic institutions, and students are embracing them because of their unprecedented and rich information that can be used to promote their learning despite the many challenges they encounter. The study recommends that Sokoine National Agriculture Library (SNAL) employ intensive promotion strategies to market e-resources subscribed by the library. Moreover, the university management should improve e-resource infrastructure, such as bandwidth and associated computer facilities, so that more students can access terminals for e-resources.

Keywords: *E-resources, research activities, academic activities, electronic information resources, university library*

1 Introduction

The university education system in Africa is developing and advancing, particularly in terms of technologies for learning, teaching, and research processes. The University library, as the main centre of the educational institution, is essential in providing electronic resources to the students to enhance academic and research activities (Ngozi et al., 2014). Electronic resources have become essential sources of information for students in University libraries. E-resources have increased the information base of university libraries and ensured the ready availability and accessibility of electronic information to students or users. E-resources are the main ingredients necessary for most university library resources today. Electronic information has steadily become an essential resource in every university library in higher learning institutions. Haridasan and Khan (2015) define electronic information resources as a resource in which information is stored electronically and accessed through electronic systems and networks.

Deng (2010) listed some examples of electronic information resources as electronic magazines, electronic books (e-books), e-databases, electronic journals (e-journals), e-magazines, electronic newspapers and archives; the rest include electronic theses, conference papers, government papers, monographs and research reports in electronic form. The development of e-resources has rapidly transformed information access and management procedures in the academic environment, particularly in university libraries.

According to Dadzie (2007), the potential of electronic resources is invaluable since they serve as research tools that complement print-based resources in a traditional library setting. She further listed the benefits of electronic information resources, such as access to information that might be limited to the user because of distance or finances and access to more current information. It is noteworthy that through electronic resources, students, researchers and other scholars now have access to global information resources, particularly the Internet, for their scholarly communication.

Therefore, e-resources are essential in the academic process of higher learning education. This allows university libraries to influence higher educational institutions' research, learning, and teaching. A typical Tanzanian student wants specific information as quickly as possible, like his counterparts in other countries like America. However, the cost of information resources like periodicals and indexes continues to rise, and publishing costs continue to grow, increasing the cost of books. Nevertheless, the solution uses electronic resources, sometimes free or open to access without a subscription.

Likewise, attitude is crucial in utilising electronic information resources among university students. Attitude represents a mental and neural readiness organised through experience. Davis (1993) also defined attitude as "an individual's positive or negative feelings of performing the target behaviour". A positive attitude is essential for university students when using electronic information resources. Using electronic information resources requires a positive attitude from the users. Attitudes concerning the environment and electronic information resources differ among people. A positive attitude towards reading is one of the strongest correlates of reading achievement.

Little is known about undergraduate students' attitudes towards using electronic information resources in higher learning institutions in Tanzania, notably Sokoine University of Agriculture. Many studies that have been conducted in the country have focused on the usage of electronic resources by university libraries. Some of them include that done by Katabalwa (2016), who investigated the use of electronic journal resources by postgraduate students; Isibika and Kavishe (2018), who investigated the utilisation of electronic resources by postgraduate students; Angello (2010) studied the awareness and the use of electronic resources by livestock researchers and Mwantimwa and Elia (2017) on utilisation of e-resources to support teaching and research in higher learning Institutions by academic staffs. None of these studies, however, have adequately addressed the perceptions and attitudes toward the use of e-resources by undergraduate students. Thus, without a better understanding of student's attitudes toward using e-resources, it is difficult for service providers to know if they are effectively meeting students' needs. Also, this will help the library planners, university, and/or library and information science educators rethink how to improve electronic resource access and utilisation by undergraduate students at the university.

Therefore, this study intended to assess undergraduate students' attitudes towards using electronic information resources in higher learning institutions in Tanzania, notably Sokoine University of Agriculture. Specifically, the study intended to determine undergraduate students' attitudes towards using electronic information resources, their awareness of the available electronic resources, their frequency, and the factors influencing their usage.

2 Literature review

2.1 The use of electronic resources by students in academic libraries

Electronic resources (ERs) in academic libraries broaden the range of available information and add value to the content by making it digitally accessible (Daramola, 2016). A study by Oyewo and Bello (2014) observed that cyber restrictions, lack of guidance on use, slow connectivity and poor computer literacy skills are some constraints affecting how students access and use electronic information resources for academic study and research. Their findings further revealed that electronic information resources are inadequate because

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undergraduate students have negative attitudes towards them. It was recommended that special computing skills be acquired before one can be competent enough to use these resources effectively. In another study by Dadzie (2007) to investigate the use of ERs by students and faculty of the Ashesi University in Ghana, it was revealed that general computer use for information access was high. The study recommended the introduction of information competency across the curriculum and introducing a one-unit course to be taught at all levels. Students are aware of the existence of ERs. However, their optimal use is hampered by limited access due to a lack of information-searching skills, limited space, slow bandwidth and erratic power supply.

Similarly, Omosekejimi et al. (2015) revealed that the use of ERs has had a tremendous impact on the academic performance of undergraduate students but that there is a need to acquire more skills in using these resources. Joshua (2014) investigated the extent to which undergraduate and postgraduate students of the University of the Philippines use the e-resources of the general reference section of the main library. It was found that students barely used the e-resources because of inadequate awareness and mobilisation. Similarly, Dukić and Strišković (2015) observed that variables, such as gender, level of study, enrolment status and field of study, affect the use of ERs in Croatian university libraries.

2.2 Students' attitude towards the use of e-resources in higher learning institutions

Information technology plays a vital role in our lives. Everything is influenced by information technology today. The students of every stream are dependent upon e-learning through the use of computers and Internet availability. In a study undertaken by Dhamija (2014) to assess the attitude of undergraduate students towards the use of e-learning utilising a sample size of 300 undergraduate students of the Kurukshetra district, an attitude Scale for e-learning was developed and administered to them. A t-test was applied to determine the significance of the difference between different groups. The results indicated that most undergraduate students have a positive attitude towards e-learning. No significant difference was found in the attitude of Arts and Science, Arts and Commerce, or Science and Commerce undergraduate students towards using e-learning. However, a significant difference was seen in the attitude of Male and Female and Urban and Rural undergraduate students towards using eLearning. A similar study was essential to carry out at SUA to gauge whether a similar attitude or a different one would be established.

2.3 The influence of information literacy on electronic resources usage by students

A positive relationship between information literacy (IL) and the use of ERs has been observed in the literature. Ukachi (2014) observed a positive correlation between an undergraduate student's IL skill level and using ERs provided in the library. The author posited that, in many instances, ERs are not adequately used because undergraduate students do not possess adequate information literacy skills. Similarly, Adeleke and Emeahara (2016) observed a significant relationship between IL and the use of ERs by postgraduate students of the University of Ibadan in Nigeria. Information literacy has been identified as a critical part of the solution to access to information and the management of information resources (De Jager & Nassimbeni, 2001). The American Library Association (ALA) provided a universally accepted definition of IL as the ability to recognise when information is needed and to have the ability to locate, evaluate and use effectively needed information [American Library Association (ALA), Association for College and Research Libraries (ACRL), 2000]. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2008) defined information literacy as one's ability to recognise his/her information needs, locate and evaluate the quality of information, store and retrieve information, make effective and ethical use of information and apply information to create and communicate knowledge. The South African government appreciates the value of IL and has taken several measures to enhance information literacy in schools. For example, the Council on Higher Education in South Africa has specified information competence in all levels of qualification granted by universities and Technikons. For example, at Exit Level 7, completion of a general degree, the formulation for this competence is specified as developed

information retrieval skills and using information technology skills effectively (De Jager & Nassimbeni, 2001). Other factors have been reported by Arif and Ameen (2011) to be English literacy and library assistance, which affect attitudes toward ER use through perceived ease of use. Library assistance and perceived ease of use affect attitudes towards the use of ER through perceived usefulness. A similar study was required at SUA to determine how IL sessions may have influenced e-resource usage.

3 Methodology

The study was conducted at Sokoine University of Agriculture in Morogoro, Tanzania. The study area was selected purposively as it is among the universities in Tanzania whose libraries are equipped with ICTs and possess subscribed e-resources. A cross-sectional research design was adopted for this study. The design allows a researcher to collect data at a single point. The nature of the study objectives dictated the adoption of such a research design. The study population comprises first-year, second-year, third-year and fourth-year undergraduate students in six selected departments from three (3) colleagues at the Sokoine University of Agriculture.

A combination of purposive sampling and simple random sampling techniques was adopted to select the respondents for the study. Three colleges were purposively selected from the university. A purposive sampling technique was also used to select two departments in both colleges based on their possession of large numbers of students and their proximity to the library location. From each department, 50 students were randomly selected from all levels (first year, second year, and third year) to make a sample size of 300 respondents. Saunders et al. (2007) argue that a sample size of 30 or more will usually result in a sampling distribution that is very close to the normal distribution, and the larger the absolute size of a sample, the closer its distribution will be to the normal distribution. Simple random sampling was used since it gives each case in the population an equal chance of being included in the sample (Benard & Dulle, 2014).

Data were collected from the respondents through a questionnaire administered to three hundred respondents using face-to-face interviews. Both closed and open-ended questions were included in the questionnaire. However, personal observation was also done to supplement information. The quantitative data collected from the questionnaire was coded and summarised before analysis using the Statistical Package for Social Sciences (SPSS). A three-point Likert scale with values 1-Highly Favourable, 2- Moderate Favourable, and 3- Slightly Favourable was used to determine undergraduate students' attitudes towards electronic information resources.

4 Results and discussion

This section presents the results and discussion of the research findings based on the objectives.

4.1 Demographic information

This study interviewed a total of 297 respondents. Among them, 51.9% were males and 48.1% were females. Regarding age distribution, a majority (42.8%) were 18-25. Their course distribution and years of study are indicated in Table 1. The results indicate an almost equal distribution regarding respondents' sex, implying that both male and female students were represented in the study. It also shows the current government's efforts to reach a 50:50 enrolment ratio of students in Tanzania. The age distribution likewise shows that most of the population is within the college age range. Demographic information is essential in this study to gauge the suitability of respondents and elicit suitable information for the study. For libraries, demographic information may also help to re-orient their collection policies and practices for e-resources.

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Table 1: Demographic information of respondents

Categories	F	%
Sex		
Male	154	51.9
Female	143	48.1
Total	**297**	**100**
Age		
18- 25 years	127	42.8
26 -33 years	103	34.7
31 -41 years	65	21.9
42 and above	2	0.7
Total	**297**	**100**
Courses		
Bsc Human nutrition	48	16.2
BVM	20	6.7
BSc Horticulture	51	17.2
Bsc Wildlife management	38	12.8
Bachelor of science in aquaculture	50	16.8
Bsc Agriculture General	45	15.2
Bachelor of Science in Animal Science	45	15.2
Total	**297**	**100**
The year of study		
1 year	83	27.9
2 year	105	35.4
3 year	109	36.7
Total	**297**	**100**

4.2 Perceived attitude towards use of e-resources

Apart from finding out the attitudes that influence the willingness to use e-resources, students were asked to rate their attitudes towards the use of e-resources. Results in Table 02 indicate that a majority of students (41.8%) rated it highly favourable, 56.6% moderately favourable, and 32.7% rated it slightly favourable. This implies that over half the majority had a moderately favourable attitude toward electronic information resource usage. This moderately favourable attitude is because most students are aware of electronic resources and the academic benefits offered, which creates a positive attitude toward their usage. A positive attitude toward its usage can positively impact students' utilisation and improve their academic performance. A positive attitude towards reading is one of the strongest correlates of reading achievement.

Table 2: Attitude toward the use of electronic resources

Attitude to the use of electronic resources	F	%
Highly favorable	124	41.8
Moderately favorable	168	56.6
Slightly favorable	97	32.7

4.3 Awareness of e-resources existing in the library

Electronic resources are becoming more and more imperative and valuable for the academic community. This is a matter of concern, as electronic resources and the Internet are essential tools for effective teaching

and research. Many users need to know the complete potential of electronic resources. In order to find out the level of awareness of e-resources among students, the study found that most students (98.0%) were aware of e-resources (Table 3). The implication is that most students joining the university currently are aware of e-resources, which further shows that the universities, especially libraries, are currently promoting e-resources reasonably well. The university library, SNAL, in particular, is known to conduct several information literacy sessions during a year. First-year students are typically given orientation to using the library (including e-resources), which are the factors that improve the existing level of awareness.

Other studies have also demonstrated that e-resource use, including their awareness, positively influences academic performance. For instance, it is said that electronic resources play a vital role in promoting students' learning in higher education. In research to investigate predicting factors for effective e-resource usage, problems and practical implications were identified by Ruzegea and Msonde (2021), and findings demonstrated that undergraduates demonstrated higher usage levels of e-resources than postgraduates. The education level, Information Literacy (IL) competency, and individual experience contributed to effective e-resources utilisation. Therefore, integrating IL skills into postgraduate curricula and improving IL training may bring out valuable students' competence for effective e-resource utilisation.

Table 3: Aware of the existence of electronic information resources

Response	Frequency	Per cent
Yes	291	98.0
No	6	2.0
Total	297	100.0

4.4 Kind of e-information resources that students are aware with

Students reported being aware of several e-resources, including e-books, online journals/databases, e-articles, e-magazines/news, CD-ROMs, e-mails and e-dictionaries to a great extent. The least known e-resources were institutional repositories and e-discussions (Table 4).

Table 4: E-information resources known by students

E resources	Respondents who are aware of information resources	
	F	**%**
E book	214	72.1
E - Journals	179	60.3
Online database	248	83.5
E- articles	140	47.1
E -magazines/news	102	34.3
CD - ROM	52	17.5
Institutional Repository	29	9.8
E- mails	161	54.2
E- discussions	15	5.1
E - dictionaries	84	28.3

It was also essential to find out if students use the known resources. It was found that most of them (97.6%) used the resources (Table 5).

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Table 5: If using electronic information in academic work

Response	Frequency	Per cent
Yes	290	97.6
No	7	2.4
Total	297	100.0

4.5 Kinds of e-resources used in academic work by undergraduate students

When asked about the type of e-resources used in academic work, the following were mentioned by students: e-books, e-journals, online journals, e-articles, e-magazines, and e-dictionaries at varying levels. The least used was the institutional repository (Table 6). This implies that the library has not yet invested heavily in the publicity of the potential that institutional repositories may offer to undergraduate students. The reason may be that institutional repositories at SUA typically archive mainly postgraduate theses and dissertations that are out of the scope of use by undergraduate students. However, this might be due to the students' negative attitudes rather than academic requirements.

Table 6: Types of electronic resources used in academic work

Type of electronic resource	F	%
E book	215	72.4
E - Journals	152	51.2
Online database	242	81.5
E- articles	136	45.8
E -magazines/ news	85	28.6
CD - ROM	36	12.1
Institutional Repository	29	9.8
E - dictionaries	82	27.6

4.6 Use pattern of e-resources by undergraduate students

It was essential to find out the usage pattern of e-resources in terms of frequency of use of the mentioned e-resources. The results indicate that many students use known and existing e-resources daily, followed by those who use them weekly. However, many students use them occasionally and those who have never used them (Table 7). Online databases, e-books, e-articles, and e-mails surpassed the rest of the resources regarding frequency of use. This might be because these resources are used mainly when students write their special projects, as many instructors direct their students to refer to these e-resources at this phase. CD-ROMs and institutional repositories are minimally used in terms of frequency. In supporting this, a study by Omowumi et al. (2019) in Nigeria on the level of e-resources used by college students revealed that e-books, e-serials, e-databases, e-magazines, e-journals, CD-ROM, e-mails, e-project and dissertations are the primary electronic information resources available and most frequently used by college students at Osun State University.

Table 7: Frequency of using the electronic resources

Extent of using the e-resources	Daily		Weekly		Monthly		Occasionally		Never	
	F	%	F	%	F	%	F	%	F	%
E book	49	16.5	69	23.2	10	3.4	85	28.6	84	28.3
E - Journals	44	14.8	80	26.9	7	2.4	35	11.8	131	44.1
Online database	103	34.7	94	31.6	13	4.4	44	14.8	43	14.5
E- articles	44	14.8	66	22.2	8	2.7	20	6.7	159	53.5

Extent of using the e-resources	Daily		Weekly		Monthly		Occasionally		Never	
	F	%	F	%	F	%	F	%	F	%
E -magazines/ news	36	12.1	38	12.8	5	1.7	7	2.4	211	71.0
CD - ROM	3	1.0	5	1.7	20	6.7	10	3.4	259	87.2
Institutional Repository	4	1.3	6	2.0	9	3.0	10	3.4	268	90.2
E - dictionaries	30	10.1	19	6.4	9	3.0	27	9.1	212	71.4
E- mails	77	25.9	54	18.2	6	2.0	18	6.1	142	47.8

4.7 Tools used to access e-resources by undergraduate students

Students were found to use a variety of tools to access the e-resources. Use of own computers (54.9%) was the major tool, followed by smartphones (29%) and library computers (12.5%). Only 6 students (2.0%) use the Internet café to access the e-resources (Table 8). These results show that many students own laptops to access these e-resources. Many students are showing a trend towards using smartphones nowadays to access e-resources. This means they can now access e-resources outside the university and the library, a positive development in e-resource use for academics.

Table 8: Tools used to access the electronic resources

Tool	F	%
Library computer	37	12.5
My own computer	163	54.9
My smart phone	86	29
At the Internet cafe	6	2
No response	5	1.7
Total	297	100

4.8 Factors influencing (motivating) students to use e-resources

In order to find out the factors that influenced or motivated students to use e-resources during their studies at the university, it was necessary to run out data using SPSS software version 20. The results produced are presented in Table 9 using the ordinal regression model.

Age, year of study and sex were hypothesised to be the attitude predictors of students' usage of e-resources. It was found that age influenced the use of online databases statistically at a 1% level of significance (p = 0.008) (Table 2). However, the most significant predictor of usage of e-resources was the year of study, which has a significant influence on several e-resources at a 1% level of significance, including e-books (p=0.001), e-articles (p=0.0001), an institutional repository (p=0.010) and e-journals (p=0.0001) (Table 2). The gender of respondents had a contribution, but that was not statistically significant at either 1% or 5% levels of significance. The reason for the influence of the year of study might be due to the increased awareness and a need for undergraduates in their third year of studies to use e-resources when they are required to use e-resources when writing their special project reports. Other studies have also found an influence of age and level of study on the usage of e-resources by students. For example, a study by Ng and Tan (2017) found that students who are more likely to use E-library consist of older, recent enrollees and orientation session participants in their study to examine the association between socio-demographic and programme-related factors and usage likelihoods of two types of e-resource platforms (E-library and Learning Management System (LMS) by Open Distance Learning (ODL) university students.

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Table 9: Factors influencing the usage of e-resources

e-resource	Age			Year of study			Sex(Reference Female)		
	Est.	**Wald**	**Sig.**	**Est.**	**Wald**	**Sig.**	**Est.**	**Wald**	**Sig.**
e books	-.052	.147	.701	.443	10.580	.001	-.271	1.682	.195
online database	.367	7.113	.008	-.100	.551	.458	.108	.262	.609
e articles	-.071	.231	.631	.878	31.713	.000	-.235	1.060	.303
E -magazines/ news	-.086	.273	.601	.238	2.103	.147	-.311	1.507	.220
CD ROM	.226	1.065	.302	.275	1.430	.232	-.200	.330	.565
Institutional repository	-.470	3.040	.081	.714	6.556	.010	.125	.098	.754
e journals	.072	.266	.606	.752	26.542	.000	-.127	.341	.560

4.9 Challenges facing the use of electronic information resources by undergraduate students

Students mentioned several challenges to influence and hinder them from using e-resources effectively during academic work. Some of them include a lack of training in using e-resources, unreliable Internet connectivity, insufficient e-resources in the field and difficulty in identifying relevant information to meet the information needs. The lack of training in using e-resources surpassed the other challenges by 44.1% (Table 10). This calls for more efforts during information literacy and orientation sessions to train students on the kinds of e-resources used and thorough information search techniques, including crafting queries and evaluating search results.

A study by Omowumi et al. (2019) also found that slow Internet connectivity, inadequate computer facilities, epileptic power supply and poor infrastructural facilities are the major challenges that students encounter while using electronic information resources. This implies that these challenges are more common across many high-learning institutions in developing countries. However, in another study by Orsu (2017) to explore the direct and indirect factors underlying the students' challenges with the use of online information resources at the University of Nigeria, Nsukka and propose the implications of these challenges, it was reported that few online resources were widely used and that the participants preferred accessing these resources from Cyber cafes. The greatest of the direct factors underlying students' challenges with the use of online information include lack of browsing skills, low Internet bandwidth and insufficient ICT infrastructure. In contrast, the indirect factors include lack of Internet access at home, absence of online assignments, lack of motivation to use online information, and the majority of the students not having personal laptops.

Table 10: Challenges facing the use of electronic information resources by undergraduate students

Challenges	Strongly agreed		Agreed		Strongly disagreed		Disagreed		No response	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Lack of training in the use of e-resources	131	44.1	116	39.1	20	6.7	25	8.4	5	1.7
Unreliable Internet connectivity	70	23.6	135	45.5	30	10.1	57	19.2	5	1.7
Insufficient e-resources in the field study	57	19.2	94	31.6	51	17.2	90	30.3	5	1.7
Difficultly in identifying relevant information to meet the information needs	126	42.4	129	43.4	28	9.4	9	3.0	5	1.7

5 Conclusions

Conclusively, a positive attitude and awareness of the usage of electronic resources by the Sokoine University of Agriculture undergraduate students can play significant roles in improving and increasing

resource utilisation and, hence, positively influence students' academic learning. Nevertheless, some factors, such as lack of training in using e-resources, unreliable Internet connectivity, insufficient e-resources in the field and difficulty in identifying relevant information to meet the information needs, were discovered as hindrances to the undergraduate students towards using e-resources.

6 Recommendations

From the findings above, the study makes the following recommendations:

- The university management, particularly SNAL, should employ intensive promotion strategies to market e-resources subscribed by the library.
- The university management should improve e-resource infrastructure, such as bandwidth and associated computer facilities so that more students can access terminals for e-resources.
- The SNAL should conduct regular information literacy sessions for students, in which they should be taught the entire array of information search techniques to improve the effective and efficient use of existing e-resources.

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25. Integrating 21st Century Skills in Public Libraries: The Case of Zambia

Velenasi Mwale Munsanje*; Mutinta Mweemba Nabuyanda**

*Chaing Mai International School
velenasim@gmail.com

**National Institute of Public Administration
m.nabuyanda@nipa.ac.zm

Abstract

Libraries provide access to information, education and research, and social participation in national and sustainable development. They are regarded as hubs of national development in that they play a critical role in the growth of a nation. Among these, public libraries are the most extensive as their services target the public and not a specific clientele. For this reason, institutions responsible for public libraries must ensure that they are abreast with the latest trends in library service provision so that they are relevant to the communities they serve and the country at large. In order to survive in today's world, people need 21st-century skills. The 21st-century skills include three categories of skills, namely, Learning Skills (critical thinking, creativity, collaboration and communication), Literacy Skills (information, media and technology literacy), and Life Skills (flexibility, leadership, initiative, productivity and social skills). Public libraries are well-positioned to help patrons build the skills to adapt and fit in the 21st century. With the current population of over 19 million people serving in Zambia, it is essential to ensure that public librarians are well-equipped with knowledge of 21st-century skills. The objectives of this study included determining what 21st-century skills were being integrated into public library services and determining the extent to which public libraries in Zambia were integrating the 21st-century skills. The study further sought to recommend how public librarians could fully integrate 21st-century skills into their services. This study targeted all the 23 main public libraries in Zambia - including their functional branches. The study used both quantitative and qualitative methodology. Questionnaires were administered, and follow-up interviews were conducted with librarians in charge of these libraries.

Keywords: *21st Century skills, public libraries, library services*

1 Introduction

The role of public libraries today has gone beyond the traditional functions of libraries that mainly involve collecting and disseminating information. This is mainly due to the rapid technological advancements and the ever-evolving landscape of information. Public libraries are defined as libraries that are accessible by the general public and are generally funded from public sources, such as taxes (Idiegbeyan-Ose, 2015). Allen and Van der Velden (2012) observed that the world is changing rapidly in many ways, but the dominant change is in ICT. They further noted that changing technology has far-reaching implications for how we interact at work, in education, civic life and at home. Furthermore, this change is the driving force behind many other major changes, such as flexibilisation.

These changes have led many scholars to point to a new set of skills – the so-called 21st-century skills – that are essential for people's ability to function and participate fully in today's world. This also has had an impact on public libraries' provision of services. In order to remain relevant in such a dynamic world, public libraries are continually striving to be abreast with changing technologies. Regardless of age, community members must navigate this rapidly changing world; integrating 21st-century skills in library service provision is one way of achieving this. Voogt and Roblin (2010) regard 21st-century skills or competencies as an overarching concept for the knowledge, skills and dispositions that citizens need to contribute to the knowledge society. To affirm this, Bruno (2023) also regards 21st-century skills as

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the competencies students need to succeed in an increasingly interconnected and complex world. Bruno further qualifies that 21st-century skills include academic and life skills that support people in school and their careers (2023). These skills, according to Bruno (2023), are categorised as follows: Learning Skills (critical thinking, communication, collaboration and creativity); Life Skills (flexibility, initiative, social skills, productivity and leadership); and Literacy Skills (information literacy, media literacy and technology literacy). These skills are essential to society's prosperity in the 21st century. Such skills are not necessarily academic but essential because they are needed to succeed in an innovation economy.

Public libraries are dynamic and inclusive spaces accessible to all that connect local citizens to lifelong learning opportunities (Silvano, 2023). Among the many significant roles that public libraries play, they empower citizens with digital skills, closing the digital skills gap. This is very important as these libraries welcome a diverse group of citizens. Silvano further observed that integrating 21st-century skills in public library services is essential for preparing individuals for success in the digital age, fostering lifelong learning and civic engagement, bridging the digital divide, and promoting innovation within communities (2023). Therefore, integrating 21st-century skills within library services emerges as a pivotal aspect in ensuring their relevance and efficacy in catering to the diverse needs of patrons in contemporary society.

This research endeavoured to explore how public libraries in Zambia integrated 21st-century skills into their library services, establish how they integrated 21st-century competencies into their programming, and recommend how they could fully integrate 21st-century skills into their library services. The significance of this research lies in its potential to support public librarians in considering the survival skills needed by today's citizens in their services. This is important in building sustainable communities.

The following literature review explored integrating 21st-century Skills in public library service provision. Public libraries, with their commitment to lifelong learning and community empowerment, are uniquely positioned to foster the development of these skills among different categories of library users.

Kine and Davidson (2022) conducted a study to explore public librarians' involvement in improving media literacy and promoting civic participation in Latvia. The findings revealed that librarians could strengthen information consumption skills by providing lifelong learning opportunities for all members of society. The study also revealed several problematic aspects: lack of methodological materials specifically for library use, difficulty in reaching audiences who needed media literacy training and insufficient media literacy skills among libraries. The librarians in the study stated that more up-to-date knowledge of media literacy was required, as technological developments had changed the criteria by which information was evaluated.

A study was conducted in 2012 to examine the Internet-related responses of public libraries to the sustained economic downturn of previous years (Taylor et al.). The study revealed that to meet the needs of the local communities that libraries served, most library services relied on the capacities of the Internet, public access technologies, and Internet-enabled services provided by the library. The study also concluded that the new economy and the 21st-century skills accompanying it hugely influenced virtually every sector of American life.

2 Methodology

This study adopted a mixed-methods research design, incorporating quantitative and qualitative data collection techniques. Additionally, it employed a case study approach to provide in-depth insights into the integration of 21st-century skills in public library service provision. The mixed-method interpretation was used to interpret the findings holistically, using both the qualitative and quantitative findings to generate conclusions and recommendations.

This study used the complete enumeration method to collect data from all 23 main public libraries in Zambia and their functional branches. The national databases for public libraries in Zambia - Ministry of Education (MOE) and Ministry of Local Government (MLG) were considered. At the time of this

research, Zambia had 23 functional main public libraries and 25 branch libraries, giving 48 libraries. The research targeted leading public librarians whose responses included their branches as well.

The study used Google Forms and unstructured interviews to collect information from librarians. A Google form was created, and questions were generated. The Google form was used to collect data from the public librarians. The forms contained both closed and open-ended questions. A link was shared with the librarians. Follow-up online interviews were conducted with 12 librarians who needed to clarify the responses given in the online survey. Google form allowed for automatic quantitative data analysis while qualitative data was analysed thematically.

3 Findings of the study

At the time of this study, Zambia had 48 functional libraries—23 main libraries and 25 branches. Tables 1 to 3 below indicate that different ministries and organisations manage the public libraries in Zambia.

At the time of this study, the Ministry of Local Government and Rural Development (MLGRD) in Zambia managed the majority (43%) of the leading public libraries. As shown in Table 1 below, MLGRD libraries covered 4 out of the 10 provinces in Zambia, with most libraries located in the Copperbelt Province. MLGRD had ten main public libraries and 16 functional branch libraries at the time of this study.

Table 1: Public Libraries in Zambia under MLGRD

Main Library	Branches	Province
Kabwe Public Library	Bwacha, Katondo, Makululu & Kasanda	Central
Kitwe Public Library	Buchi	Copperbelt
Kalulushi Municipal Council Library	Chambishi	Copperbelt
Chingola Municipal Council Library	-	Copperbelt
Chililabombwe Municipal Council Library	-	Copperbelt
Ndola City Council Library	Kabushi, Central, Lubuto, Twapia & Chifubu	Copperbelt
Hellen Kaunda Memorial Library	Mpatamato	Copperbelt
Samuel Reuben Mwewa Public Library	Kamuchanga	Copperbelt
Lusaka City Council Library	Chilenje, Matero & Mtendere	Lusaka
Livingstone City Council Library	-	Southern

The Ministry of Education (MOE) managed about 35% of the country's leading public libraries. There were eight main public libraries and nine branch/district libraries, and library services covered 7 of Zambia's ten provinces.

Table 2: Public Libraries managed by MOE

Main Library	Branches	Province
Chipata Provincial Library	-	Eastern
Mansa Provincial Library	Kawambwa	Luapula
Zambia Library Service - Headquarters Public Library	-	Lusaka
Kasama Provincial Library	Luwingu, Mporokoso, Mbala	Northern
Solwezi Provincial Library	Kabompo & Mwinilunga	North-Western
Mazabuka Public Library	-	Southern
Choma Provincial Library	Kalomo	Southern
Mongu Provincial Library	Kalabo & Senanga	Western

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Lubuto Library Partners (LLP), a non-governmental organisation, managed about 22% of the leading public libraries in Zambia. As shown in Table 3 below, the library services covered two provinces.

Table 3: Public Libraries managed by LLP

Main Library	Province
Lubuto Model Library	Lusaka
Lubuto Mthunzi American Youth Library	Lusaka
Lubuto Komboni Library	Lusaka
Mumuni Choma Library	Southern
Mumuni Nabukuyu Library	Southern

The study revealed that 88% of the librarians managing the leading public libraries had a Library and Information science-related qualification. The study also revealed that most of the staff managing the leading public libraries had a Bachelor's degree (64%), 20% had a Diploma, 12% had a Master's, and 4% had a Certificate. This is evident in Figure 1 below.

What is your highest qualification
25 responses
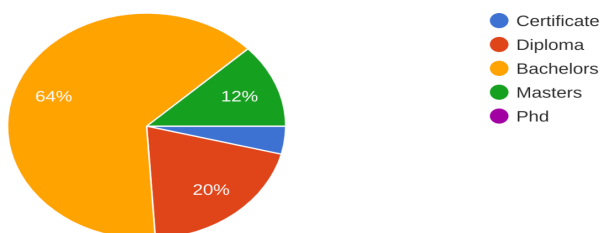
Figure 1: Level of education of staff managing main public libraries in Zambia

This study revealed that about 32% of public libraries in Zambia, together with their branches and/or district libraries, served a population of up to 1000 people, and the rest of the beneficiaries were, as shown in Figure 2 below.

Approximately how may people does your library serve? (includes both full members and others)
Please note that if your library has branches that yo...nsible for, their statistics must be added together.
25 responses

Figure 2: Population being served by Public Libraries in Zambia

Public librarians in Zambia integrated all the 12 skills that were asked of them. Table 5 below shows the number of libraries that integrated each of the 12 skills in their library services. Collaboration, social, leadership, and

communication topped the list, each covered by 80%+ libraries. 60-80% of the libraries integrated flexibility, information literacy, critical thinking, creativity, technology literacy and initiative. Productivity and media literacy were the least integrated, only 48% of the libraries. This is evident in Table 4 below.

Table 4: Integration of 21st Century Skills by Public Libraries in Zambia

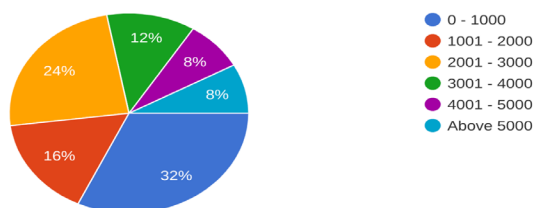| Skill	%
Collaboration (working with others)	88
Social (meeting and collaborating with others for mutual benefit)	84
Leadership (motivating a team to accomplish a goal)	84
Communication (talking to others)	80
Flexibility (deviating from plans as needed)	72
Information Literacy (understanding facts, figures, statistics and data	68
Critical thinking (finding solutions to problems)	68
Creativity (thinking outside the box)	68
Technology Literacy (understanding the machines that make the technology age)	64
Initiative (starting projects, strategies and plans on one's own)	60
Productivity (maintaining efficiency in an age of distractions)	48
Media Literacy (understanding the methods and outlets in which information is published)	48

Table 5 shows the mean for each of the 21st-century skills as rated by public librarians in Zambia. The findings revealed that the lowest mean was media literacy, with 2.88, and the highest was communication, with 4.08. The librarians rated the extent to which they integrated each of these skills on a scale of 1 to 5, with one meaning least integrated and five meaning most integrated.

Table 5: Rate of integration of the 21st Century Skills

Skill	Mean
Collaboration	3.62
Social	3.59
Leadership	3.82
Communication	4.08
Flexibility	3.69
Information Literacy	3.82
Critical Thinking	3.32
Creativity	3.73
Technology Literacy	3.25
Initiative	3.85
Productivity	3.47
Media Literacy	2.88

The study revealed the following were some of the library activities that libraries conducted:

- Collaboration - Study hubs, use of WhatsApp groups for patrons to communicate and collaborate, workshops and meetings, drama sessions
- Communication - Study hubs, drama, games, sign language story time for deaf children, open discussions
- Critical thinking - Study hubs and discussions, mentoring sessions and games, book clubs

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- Creativity - Drawings and write-ups on specific topics, study hubs, storytelling, mentoring sessions
- Information literacy - Literacy activities such as reading, spelling and writing competitions; local languages sessions; library orientation; informative sessions on various topics like child marriages, health, Constituency Development Funds (CDF); collaboration with schools in providing curriculum-related activities; adult literacy instruction, reading clubs, examination preparation skills
- Technology literacy - Computer-related training and photography, access to computers, Internet and online resources, technology for the visually impaired, using WhatsApp to receive and share information with library users
- Media literacy - Using Facebook page to share different activities, indoor talking circles and large outdoor performance spaces (drama, music and dance performances, and movie screenings), training on the use of various media, radio program exam preparation tips
- Social - Book clubs, study hub
- Leadership - Youth workshops, study hub and book club activities.
- Flexibility - Engagement in diverse activities like arts, crafts, games, and puzzles.
- Initiative - Mentoring programs, entrepreneurship sessions, quizzes and games.
- Productivity - Study hubs

Public librarians identified the following challenges in integrating 21st-century skills in their library services.

- Inadequate funding.
- Lack of needed equipment, especially ICT-related.
- Lack of Internet connectivity.
- Lack of latest or updated reading resources.
- Inadequate capacity building for library staff to conduct some activities.
- Inadequate support from parent bodies.
- Inadequate/outdated infrastructure.
- Parents are reluctant to allow children to spend time at the libraries.
- Unwillingness by some library staff to get involved in activities promoting 21st-century skills.
- Lack of interest by patrons in library activities.

4 Discussion of the findings

Integrating 21st-century skills into library services has become increasingly important as libraries strive to meet the evolving needs of their patrons in the digital age. This discussion section analysed how libraries have incorporated 21st-century skills into their programs and services. Through this analysis, we sought to identify best practices, challenges, and opportunities for further enhancement in integrating 21st-century skills into library services better to serve patrons' needs in our rapidly changing society.

Although different ministries and organisations manage Zambia's public libraries, it is essential to note that all these public libraries and librarians fall under one professional body, LIAZ. LIAZ is a professional non-profit organisation that unites all institutions and people working in libraries, archives, information centres, and other information services in Zambia (LIAZ, 2024). With its vision of promoting excellence and innovation in library and information services, LIAZ spearheads many programs for all librarians in Zambia, including capacity-building programs.

The overall response to this study by public librarians, about 92%, was exceptionally high, demonstrating the interest and commitment of public libraries. In the study, 21 out of the 23 main public libraries

participated. The responses from the main libraries included data for the branch libraries wherever applicable. Library participation in MOE and LLP was 100%. Participation from MLGRD was 80%.

The findings show that the MLGRD managed the largest % of public libraries in Zambia, 37%. However, despite managing the most public libraries, these libraries only covered four of the ten provinces, leaving 60% without council public library services.

Zambia Library Service (ZLS) runs a network of public and branch libraries across the country and is mandated to manage school libraries. LIAZ has worked closely with ZLS to create awareness of library services in the country. ZLS, in collaboration with LIAZ, has been at the core of ensuring that the MOE attends to the pending National Library Policy and Bill (Munsanje, 2014).

LLP is a non-governmental organisation that runs five public libraries in Zambia. LLP, whose *vision* is a world where all children and youth are supported by libraries to reach their full potential and realise their rights to culture and information, has provided public library services in Zambia for nearly two decades (LLP, 2024). Lubuto Libraries' doors are often the only ones open to the most vulnerable children, including those out of school, children with disabilities, girls and young mothers and those living on the street (LLP, 2024). Although LLP managed only 19% of the leading public libraries in Zambia, LLP has contributed significantly to public library services and has reached 203 280 children and youths at the time of this study. The five libraries in the two provinces greatly benefited many vulnerable children and youths with access to public library services.

The above picture created confidence that public libraries in Zambia were being managed by qualified staff. About 72% of the libraries in the survey were managed by professional librarians. According to the American Library Association definition, Nkhoma (2010) regarded a professional librarian with at least a first degree.

This study revealed that the country has a massive gap in terms of public library services. The findings revealed that all public libraries together only served a population of below 100,000 people in Zambia. With a population of over 19 million, many people in the country have no access to public library services. Figure 2 illustrates the number of patrons reached by all the participating libraries. This was a wake-up call to authorities providing public library services to either widen the current services or open up new libraries, especially in provinces and/or towns with none.

One encouraging aspect of this study was that all the twelve 21st-century skills raised were integrated into public library services. As much as the extent of integration differed, they were somehow integrated into services. The study revealed that over 80% of the public libraries in Zambia integrated collaboration, social, leadership and communication in that order, as illustrated in Table 4. About 60-80% and more of the libraries integrated flexibility, information literacy, critical thinking, creativity, technology literacy and initiative. The least to be integrated by the public libraries were productivity and media literacy, both integrated by only 48% of the public libraries.

When asked to rate the extent to which public libraries integrated each of the 21st-century skills, the results revealed that the lowest mean was 2.28, and the highest was 4.08, giving a range of 1.80. The mean was obtained by adding all the ratings for a specific skill across all the libraries that selected and rated it and then dividing by the number of ratings/libraries.

The mean findings for integrating skills in public library services suggested that public libraries in Zambia required interventions to improve the integration of media literacy, technology literacy, critical thinking, and productivity, as these had a mean of less than 3.5.

Learning skills are popularly known as 4C skills. These skills are needed to adapt to an increasingly complex work environment in the 21st century. According to the P21 Framework for 21st-century learning (2007), these skills, which comprise creativity, critical thinking, communication, and collaboration, are essential for acquiring knowledge, developing critical thinking, problem-solving, and adapting to new situations.

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Promoting critical thinking is essential in public library services. As Cuccurullo and Cinganotto (2020) observed, critical thinking is the ability to analyse information and objectively make reasoned judgments. It involves the evaluation of sources such as data, facts, observable phenomena and research findings. In today's rapidly changing and information-rich world, critical thinking is essential for problem-solving, decision-making, and navigating complex issues across various domains, such as education. It enables individuals to assess the reliability of sources, detect biases, and adapt to new situations by applying sound reasoning and evidence-based thinking. As technology advances and information becomes more accessible, critical thinking becomes increasingly valuable in distinguishing between reliable information and misinformation and effectively addressing the challenges and opportunities of the modern era. About two-thirds of the public libraries integrated critical thinking in their public library services. This mean score of 3.32 out of 5 indicated a moderate level of approval or satisfaction with critical thinking skills integration in library services among public libraries. In as much as the rating was above average, it also implied that there was room for improvement in fostering and promoting the integration of activities in public libraries that promoted critical thinking skills. The fact that 68% of the libraries provided this rating suggested that there could be varied perceptions or experiences regarding the emphasis or effectiveness of integrating activities that promoted critical thinking within these libraries. The rating could also have indicated potential challenges or barriers to developing robust critical thinking skills in the community, such as limited resources, access to relevant materials, or training opportunities. Public libraries said they conducted study hubs, mentoring sessions and book clubs to promote critical thinking. Other activities that libraries could engage in include running debate clubs and interactive exhibits. By offering these activities and opportunities, public libraries can play a crucial role in promoting critical thinking as a 21st-century skill among patrons, empowering them to become thoughtful, discerning, and analytical individuals in an increasingly complex and information-rich world.

Creativity is a critical life skill for success in the 21st Century (Salna, 2012). Public libraries must ensure that they perform activities that promote creativity as they encourage individuals to think outside the box, explore new ideas, and engage in continuous learning. By offering various creative activities, libraries support lifelong learning initiatives and provide opportunities for patrons to develop new skills and interests. Salna's (2012) assertion is echoed by Faster Capital (2023), who believed that a world that thrives on innovation and constant change requires creativity as a vital skill. Public libraries play a crucial role in nurturing creativity by providing access to various resources, from books and digital media to workshops and programs that encourage imaginative thinking. It must, however, be noted that these skills are not promoted independently of each other. In promoting creativity, patrons will be engaged in critical thinking. In the digital age, creativity is increasingly essential for adapting to rapid technological changes, fostering innovation, and bringing in technology literacy skills, among others, as needed. In Zambia, integrating creativity as a 21st-century skill in public libraries is a significant development that reflects a growing recognition of the importance of nurturing creative thinking among library patrons. The fact that 68% of these libraries embraced this initiative indicates a noteworthy effort to adapt library services to meet the evolving needs of their communities. With a mean rating of 3.73, there is a generally positive perception of the integration of creativity within these libraries. Libraries conducted drama sessions, storytelling sessions, reading sessions and many others. By offering diverse and engaging programs, libraries provide platforms for patrons to explore their creativity, express themselves, and develop essential skills increasingly valued in the 21st century. However, despite the positive strides made in integrating creativity into library services, there may still be challenges and opportunities for improvement. These include ensuring equitable access to creative resources and programs across different regions of Zambia, providing adequate training and support for library staff to facilitate creative activities effectively, and continuously evaluating and adapting creative programs based on feedback from patrons. Study hubs and drawing sessions were outlined as some activities public libraries perform to promote creativity. Other worthwhile activities include maker spaces, creative and competitive activities, and music and performance workshops.

Collaborative activities in a library are essential because they bring people together, fostering a sense of belonging and community within the library. By creating opportunities for patrons to work together on projects, discussions, or events, public libraries help strengthen social bonds and promote a supportive and inclusive environment. The fact that 88% of the libraries integrated collaboration skills into their activities indicated a strong adoption of this approach. This high adoption rate suggested that libraries recognised the importance of promoting collaboration among patrons and actively implemented strategies to facilitate collaborative experiences. The study revealed that public libraries conducted various training activities such as Information and Communication Technology (ICT) programmes and health-related talks or sessions. By offering collaborative activities, public libraries in Zambia can support patrons in their lifelong learning journeys, enabling them to adapt to change and stay relevant in a rapidly evolving world. However, despite the high integration rate, the mean rating of 3.62 out of 5 suggested a moderately positive perception of integrating collaboration skills within library activities. While the rating is above average, indicating general satisfaction, there was still room for improvement to enhance the effectiveness and impact of collaborative initiatives in libraries. Among others, public libraries engaged in study hubs to promote collaboration. Study hubs are vital in promoting collaboration as a 21st-century skill by providing dedicated spaces, organising collaborative programs, facilitating resource sharing, fostering peer learning and mentorship, integrating technology, and leveraging community partnerships to support collaborative endeavours among library users.

The study revealed that 80% of public libraries in Zambia had integrated communication. This high adoption rate showed that public libraries recognised the importance of effective communication. The mean rating of 4.08 suggested a strong perception of the effectiveness of integrating communication skills within library activities. By integrating communication skills into library activities, libraries likely supported patrons in developing the ability to communicate their information needs, critically evaluate sources, and effectively communicate their findings. Libraries could explore additional ways to integrate communication skills into their activities, provide targeted training and resources to staff and patrons, and solicit feedback to ensure that communication initiatives meet the community's evolving needs. The integration of communication as a 21st-century skill in public libraries in Zambia demonstrated a commitment to equipping patrons with essential skills for success in today's information-rich and interconnected world. One of the critical activities libraries were engaged in was using study hubs. As explained in 4.4.1.3, hubs were influential in promoting collaboration and communication, creativity, critical thinking, and many other skills.

Partnership for 21st Century Skills (2011) defines literacy skills as the ability to read, write, listen, and speak effectively in various contexts using various media and technologies. In order to be effective in the 21st century, citizens and workers must exhibit a range of functional and critical thinking skills related to Information, Media, and Technology (IMT).

Matteson and Gersch (2020) refers to Information Literacy (IL) as the ability to recognise the need for information, to effectively find information to meet that need, and to use information for some purpose or goal. The fact that 68% of public libraries in Zambia had integrated information literacy into their services indicated a moderate level of adoption of this initiative across the library system. The mean rating of 3.82 suggested a moderately positive perception of the effectiveness of integrating information literacy into library services. Although the rating was above average, indicating a generally positive view, it also indicated that there may be areas where improvements could be made to enhance the effectiveness of information literacy initiatives. Integration of information literacy into library services empowers patrons by equipping them with the skills and competencies needed to effectively locate, evaluate, use, and communicate information in various formats. This enables patrons to make informed decisions, critically analyse information, and engage meaningfully with the world around them. Some activities highlighted by public libraries aimed at promoting information literacy included literacy sessions such as reading and writing, sensitisation, informative talks and discussions on various topics, and literacy sessions in local languages. Although public libraries did not indicate that they provided research skills sessions to

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their patrons, these are very important because they focus on how research should be conducted, how to formulate research questions, conduct literature reviews and synthesise information from multiple sources. These sessions equip patrons with the skills needed to conduct thorough and credible research across various topics. Citation workshops or sessions are also important because they will ensure patrons have the skills to properly cite sources and avoid plagiarism in their research and writing.

It is through the media that we stay informed, entertained and connected. That is why it has a significant impact on our lives. This is supported by Luft (2016), who stated that understanding media and critically analysing media messages are the skills required for being media literate. Luft (2016) further defines Media Literacy (ML) as the ability to access, analyse, evaluate, and create media. ML helps us to understand the complex messages we receive from television, radio, the Internet, newspapers, magazines, books, billboards, video games, music, and all other forms of media. Many people shape their views and opinions based on the media and educating themselves. Despite different media providing various information, it comes with its challenges. Possibilities of misinformation and disinformation arise, which is why librarians are still critical in educating library patrons on detecting these vices. However, regardless of the importance of ML, the study revealed that this skill was one of the least two integrated skills, with only 48% of public libraries integrating it into their library services. Worse still, the mean of 2.88 was the least among all skills and was way below the average. This shows a relatively low adoption rate of the skill across public libraries. Public libraries could have had challenges that negatively affected their capacity to integrate ML in their library services. Despite the potential challenges, integrating media literacy as a 21st-century skill in library services is essential for empowering patrons to critically evaluate and navigate media messages in today's digital age. Media literacy skills are essential for helping individuals identify misinformation and disinformation and become great consumers and producers of media content.

This study revealed that 64% of the public libraries in Zambia adopted technology literacy into their library services. This moderate adoption rate suggested that many libraries recognised the importance of empowering their patrons with essential skills to survive and succeed in the digital age. The mean integration of 3.25, as shown in Table 5, suggested a moderately positive perception of integrating technology literacy in library services. By integrating technology literacy into library activities, librarians equip patrons with the digital skills necessary for success in education, employment, and everyday life. This is echoed by Paben and Frickle (2011), who stated that public libraries are unique in providing free and open access to computers and related technologies. A study by (Taylor et al., 2012) aimed at examining the Internet-related responses of public libraries to the sustained economic downturn of previous years revealed that in order to meet the needs of the local communities that libraries served, the library services relied on the capacities of the Internet, public access technologies, and Internet-enabled services that the library provided. Among other activities, public libraries conducted computer courses and provided patrons with digital resources. As stated in 3.3.6, other activities included access to the Internet and providing technological services for the visually impaired.

One of the challenges most libraries highlighted in the study regarding integrating technology literacy was inadequate technological facilities, including high Internet costs. This challenge could be overcome by partnering with Internet service providers to provide support through offering redacted rates.

Career and life skills, as defined by Partnership for 21st Century Skills (2011), are the ability to navigate the complex life and work environments in the globally competitive information age. Flexibility is the ability to change one's behaviour in response to different situations (CEOpedia, 2023). This means that an individual can respond appropriately to any given circumstance. It is an essential skill for any successful person, allowing them to adjust and make the most of their skills and knowledge. Therefore, flexibility as a 21st-century career and life skill entails individuals' ability to adapt, evolve, and thrive in dynamic and rapidly changing environments. Just as Gray Group International (2024) observed, flexibility is one of the essential aspects of adaptability that involves being open to new ideas, perspectives, and ways of

doing things. Flexibility allows people to adjust their mindset, embrace different approaches, and explore innovative solutions. Yukl and Mahsud (2010) also echoed that flexibility encompasses a range of attributes, including adaptability, openness to change, resilience, and the capacity to learn new skills quickly. As Table 4 indicates, 72% of the public libraries integrated flexibility in their library services. This indicates that most libraries recognise this skill's importance in the modern context. This also suggested a positive trend towards acknowledging and adapting to the changing needs of library patrons in Zambia. The mean of 3.69 suggested a moderately high rating. This meant that public libraries were making great efforts to include flexible supporting activities in their services. In today's fast-paced world marked by technological advancements, globalisation, and economic shifts, individuals who possess flexibility are better equipped to navigate uncertainties, embrace new opportunities, and effectively respond to challenges.

Leadership is a meaningful career and a 21st-century skill. Fidan (2019) defines leadership as a process in which one person influences others to achieve a common goal. Therefore, leadership as a 21st-century skill encompasses the ability to inspire, influence, and guide individuals or groups towards achieving common goals in a rapidly changing and complex global environment. In this study, 84% of the public librarians integrated library activities to build leadership skills in their patrons. This showed a high level of integration. The mean integration rate, 3.82, suggested that, on average, the level of integration was substantial, leaning towards the higher end of the scale. This indicated that public libraries in Zambia actively recognised the importance of leadership skills and were taking steps to incorporate activities to foster these skills into their programs and services. This could have had positive implications for individuals using those libraries, as they may have had increased access to resources and opportunities for developing leadership abilities, potentially contributing to personal and professional growth within their communities.

Rawlings (2022) defines initiative as the ability to be resourceful and work without always being told what to do. This requires resilience and determination. People who show initiative demonstrate that they can think for themselves and take action when necessary. Therefore, initiative as a 21st-century skill refers to the ability to take independent action and drive positive change without needing to be prompted or directed by others. It involves being proactive, self-motivated, and resourceful in identifying and pursuing opportunities or solutions to problems. The initiative is essential in professional settings and personal and civic contexts, as it empowers individuals to drive innovation, foster collaboration, and contribute meaningfully to their communities.

This study revealed that 60% of public libraries integrated initiative skills into their activities, suggesting moderate integration. The study also revealed a mean rate of 3.85, which was relatively high. This indicated that, on average, the libraries effectively integrated initiative-building activities into their programs. Overall, initiative skills are crucial for success today, enabling individuals to thrive in diverse environments and make a positive impact through their proactive and self-directed actions. People will be able to start projects, strategies, and plans on their own.

Productivity is the efficiency of producing goods and services, as expressed by some measure (Kaliski, 2001). Productivity means efficiently managing time, resources, and tasks to achieve desired goals and outcomes. It involves prioritising effectively, focusing on high-value activities, and minimising distractions and time-wasting behaviours (Daniels II, 2023). Productivity has become increasingly important due to modern work environments' fast-paced and competitive nature. With advancements in technology and increased connectivity, individuals face a constant influx of information and demands on their time. Individuals with solid productivity skills are better equipped to manage their time effectively, accomplish tasks efficiently, and ultimately achieve their goals and aspirations in today's dynamic and competitive world. This study revealed that 48% of public libraries were integrating productivity. This indicated less effort in incorporating this skill into their programs and services. The study also established a mean rate of 3.47, which was moderately high. The integration of productivity initiatives into library programs had the potential to positively impact users'

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ability to manage their time and tasks effectively, ultimately leading to increased efficiency and effectiveness in various aspects of their lives. By equipping individuals with productivity skills, public libraries can empower them to achieve their goals, fulfil their potential, and thrive in the 21st century.

Rawles (2016) observed that social skills or competencies are the behaviours that allow individuals to interact with and influence one another. Social skills encompass a range of abilities that enable individuals to effectively interact, communicate, collaborate, and build relationships with others in various personal, professional, and social settings. These skills are essential for navigating the complexities of today's interconnected world and thriving in diverse social and cultural environments. This study revealed a high level (84%) of integrating social skills in public libraries. This suggested a widespread recognition of the importance of promoting social skills amongst library patrons. The study also revealed a moderate integration rate of 3.5. Libraries could explore additional strategies to enhance social skills development among their users and increase the mean integration rate.

5 Conclusion

This research indicated a widespread recognition among public libraries in Zambia of the importance of integrating 21st-century skills into their services. This included all the essential skills for individuals to thrive in today's rapidly changing world. The findings revealed significant efforts by libraries to integrate these skills into their services, with most libraries actively incorporating them into their programs and activities. This demonstrated a commitment to providing patrons with the resources and opportunities necessary to develop essential skills for success in various aspects of life. Integrating 21st-century skills into library services can yield significant benefits for patrons, including enhanced personal and professional development, increased opportunities for success in education and employment, and improved social and community engagement. Given the importance of 21st-century skills in today's society, there is a need for public libraries in Zambia to continue focusing on integrating these skills into their services. This includes ongoing assessment and refinement of programs and activities to ensure they effectively meet the evolving needs of patrons.

6 Recommendations

- Stakeholders such as LIAZ, ZLS, MLGRD, and other organisations responsible for supporting public libraries in Zambia must spearhead capacity-building programmes for librarians.
- Stakeholders must lobby and support public libraries to create technology-rich environments.
- Funding must be increased to ensure the smooth implementation of library services.
- Libraries must consider collaborating with organisations that promote 21st-century skills.

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26. Provision of Library Services to the Marginalised Population: A Case of Selected Namibian Community Libraries

Esther Ndapewa Tobias

Namibia Library and Archives Service

Esther.Tobias@nlas.gov.na or etobias6@gmail.com

Abstract

This article examined the provision of library and information services to the marginalised population in the Namibian community libraries to examine whether library services exclusion exists in Namibia, particularly amongst the marginalised population. This research used a qualitative approach, and data was collected using open-ended questionnaires. Fifteen (15) questionnaires were sent to community libraries where most of the marginalised population resides. Fourteen (14) questionnaires were completed and returned. The findings revealed no exclusion of library services in Namibia as library services provision is extended to the marginalised population. Most community libraries use suggestion boxes and conduct user needs assessments and user satisfaction surveys to determine whether they are meeting the information needs of the marginalised users. Community libraries make efforts to take the services closer to where marginalised users reside through outreach programs and mobile libraries. There are, however, challenges as libraries face a lack of funds and transport to conduct outreach programs for the marginalised users who live far from the library. Additionally, community libraries have limited books in marginalised indigenous languages. The findings can be used to better the provision of library services to the marginalised user as well as to all library users.

Keywords: *Library service provision, library exclusion, marginalised communities, Namibia*

1 Introduction

The importance of providing library and information services cannot be overemphasised. In the current information society world, information provision and accessibility are crucial to every citizen within communities (Hoyer, 2013) since, in an information society, information provision is more essential than the distribution of any other goods (Mohan, 2012). This is because the successful participation of citizens in today's world depends mainly on the provision and use of relevant, reliable, accurate and timely information (Ayiah, 2007). As information providers, libraries provide all citizens free and equal access to a wide range of information, narrowing the gap between the haves and have-nots (IFLA, 2003). Even though inclusiveness is part of a library's core values and not an optional add-on (Hoyer, 2013). Muddiman et al. (2000) reported that some marginalised user groups receive no library services. Persons may be marginalised and excluded based on ethnic origin, gender, sexuality, physical or mental disability, education, employment and economic status.

Additionally, marginalised communities are often excluded from providing library services because their information needs have not been anticipated. It is also reported that some libraries exclude marginalised users because they fear that the majority of their users will feel uncomfortable or unsafe if the marginalised groups are allowed to enter the library (Hoyer, 2013). It has also been observed that most public libraries serving people from various ethnicities, religions, and cultures have challenges in providing equitable access to information all their users need (Akbar & Asmiyanto, 2019). That is to say, libraries tend to provide their services to the majority user groups at the expense of the minority user groups, especially those that have been underrepresented, side-lined, demoted, downgraded or disregarded in society. Consequently, excluding marginalised user groups from library services threatens social cohesion within communities and limits opportunities such as information access, education and employment (Hoyer, 2013). Thus,

there is a need to determine whether library services exclusion exists in Namibia, particularly amongst the marginalised population.

A public library is an information centre or institution mandated to provide knowledge and information services to the entire public regardless of age, race, sex, religion, nationality, language or social status (IFLA, 2003). In Namibia, community libraries were earlier referred to as public libraries (Kanengoni et al., 2017; Iilonga, 2019). The terms 'community library and public library' are used interchangeably. According to the Library Association (1995), as cited in Kabamba (n.d.), community libraries provide "Services which assist individuals and groups with daily problem solving and with participation in the democratic process. The service concentrates on the needs of those who do not have ready access to other sources of assistance and on the most important problems people have to face, problems to do with their homes, jobs, and rights". The community library's mandate is to serve the information needs of all community members, including the disadvantaged or socially excluded populations (Hoyer, 2013; Kanengoni et al., 2017). Community libraries in Namibia existed since the German colonial period, and the provision of library services was only for the white communities (Kanengoni et al., 2017). However, after Namibia's independence in 1990, the importance of libraries was highly recognised; thus, the management of libraries was taken over by the Ministry of Education under the Directorate of Namibia Library and Archives Service (NLAS) (Iilonga, 2019). This recognition brought the establishment of libraries across the 14 regions in order to provide library and information services to all the Namibian people in their respective communities, especially to the disadvantaged communities (Leonard & Ngula, 2013; Kanengoni et al., 2017; Iilonga, 2019). Currently, there are 66 community libraries in Namibia providing library services to the Namibian people (Ministry of Education, Arts and Culture, 2022).

Marginalised communities refer to disadvantaged minority groups classified by language or other cultural characteristics (EMIS, 1995). The Namibian government has recognised the San and Himba speaking people as marginalised, and many of these people live far away in rural areas (Republic of Namibia, 2017). In addition, there is a low reading level amongst the marginalised communities, and this is confirmed by Matengu et al. (2019), who state that early dropout and low education achievement were prevalent with both San and Ovahimba speaking learners. This study aimed to find how public libraries provide services to these user groups, considering their situation of being underrepresented.

2 Statement of the problem

Although inclusiveness is part of a library's core values and not an optional add-on (Hoyer, 2013), as it is clearly stated in the IFLA manifesto of 1994, public libraries should provide their service equitably to all individuals with different backgrounds, irrespective of age, race, gender, religion, and social status (Akbar & Asmiyanto, 2019). However, Muddiman et al. (2000) reported that some marginalised user groups receive no library services. During the Namibian colonial and apartheid era, library services were only provided to the white communities, excluding all the black Namibian communities. Namibian public libraries only began to provide library and information services to every citizen in the postcolonial era (Iilonga, 2019; Leonard & Ngula, 2013). It is, however, not known whether the provision of library services has been extended to cater to the marginalised population's information needs. Thus, there is a need to determine whether library services exclusion exists in Namibia, particularly amongst the marginalised population.

This article aims to determine whether library and information services are extended to marginalised communities, the minority in Namibia. The study seeks to examine the provision of library and information services to marginalised communities and determine the challenges in providing them with these services.

This research was deemed essential to the library sector and the entire country. The Republic of Namibia's late President, His Excellency Dr Hage Geingob, would always say, "No one must feel left out" Hence, the research was carried out to assess whether public libraries are providing their services to the entire Namibian

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population, including the marginalised communities. The research is also in support of resolution 59 of the UN General Assembly adopted in 1946, as well as by Article 19 of the Universal Declaration of Human Rights (1948), which states that the fundamental right of freedom of expression encompasses the freedom to seek, receive and impart information and ideas through any media and regardless of frontiers.

3 Related literature review

Generally, marginalised refers to someone disregarded or pushed aside due to social, economic and political inequality. According to Wang et al. (2018), the marginalised population refers to the people who are socially excluded due to physical defects or differences from the social mainstream in social mobility, culture, and ideas. They include paralysed people, migrant workers, left-behind children, unattended older adults, dropouts, the unemployed, the homeless, and prisoners. The Namibian government has recognised the Kwe, Hai-dom, Joehansi and Khu groups, who are informally known as San communities, and the Zemba and Ovatue, who are known as Ovahimba communities, as marginalised (Matengu et al., 2019). These marginalised populations have not received many of the benefits promised since Namibia's independence in 1990.

Additionally, they suffer from low levels of education and have little or no political representation (Cultural Survival, 2016). This is confirmed by Matengu et al. (2019), who state that early dropout and low education achievement were prevalent among San and Ovahimba learners. They are considered as one of the poorest people in Namibia (Cultural Survival, 2016). Many of Namibia's marginalised communities live in rural areas and on farms, where they tend to be small-scale subsistence farmers (Republic of Namibia, 2017). The San-speaking communities reside in several parts of the country, as shown in Figure 1. The Himba people are descendants of the Herero, who now mainly live in central and eastern Namibia. They live in the Kunene Region along the far north-western part of Namibia (Mota, 2020; Matengu et al., 2019).

San language	Dialect group	Region
!Kung	!Kung (//'HengaKxausi and Omatako !Kung)	Otjozondjupa Omaheke Kavango
	Mpungu OvaKwankala	Kavango Omusati, Oshana, Ohangwena, Oshikoto ("the 4 'O' Regions")
	!Xu (Vasekele)	Otjozondjupa Kavango Caprivi
	Ju/'hoansi	Otjozondjupa Omaheke
	Omaheke Ju/'hoansi (‡Au//eisi, Makaukau and Auen)	Omaheke
!Xo	N//usan	Omaheke
Khoe	Nharo	Omaheke

Kxoe	//XoKxoe
	//OmKxoe
	BugaKxoe
	BumaKxoe
		Kavango and Caprivi

Hai//om (Koekhoegowab)	Keren	Oshikoto Kunene
	Kwankala	Kavango Oshikoto
	!Kung-Hai//om	Kunene Oshikoto

Figure 1: The San-speaking communities Source: Imagine adapted from (Suzman, 2001)

The right to information access cannot be overemphasised. Access to diverse and independent sources of information helps citizens participate in civil and political activities, which are vital for consultative and

participatory democracies (Tibinyane, 2018). Hence, the African Charter on Human and Peoples Rights (ACHPR) guarantees the right to access information in Article 9, which clearly states that "Every individual shall have the right to receive information" (African Commission on Human and Peoples Rights, 2002). Freedom of information is a vital part of the fundamental right of freedom of expression, as recognised by resolution 59 of the UN General Assembly adopted in 1946, as well as by Article 19 of the Universal Declaration of Human Rights (1948), which states that the fundamental right of freedom of expression encompasses the freedom to "to seek, receive and impart information and ideas through any media and regardless of frontiers" (United Nations, n.d.).

Even though the Namibian Constitution does not expressly provide for the right to access information. However, article 21 guarantees "freedom of speech and expression, which shall include freedom of the press and other media" (Tibinyane, 2018; Nakuta & Mnubi-Mchombu, 2013).

Public libraries are local information centres or gateway to knowledge that freely offer their services to anyone who wishes to utilise them. They provide platforms that enable lifelong learning by providing all kinds of information to as many people as possible (IFLA-UNESCO, 2022; IFLA, 2003). They provide resources and services that serve the needs of all people from the surrounding communities without discrimination (IFLA, 2003). They provide various services that help strengthen reading habits among children, young people and the general public, including establishing reading clubs and other programs (Adhikary et al., 2019). In Namibia, the primary services provided by public libraries include free Internet access, reference services, printing, photocopy and scanning services at a minimal fee, free ICT/computer training, reading/ study facilities, children's library sections, homework support, reading competitions for children, television broadcasting, online databases and inter-library lending (IFLA Library Map of the World, n.d.)

As per the IFLA public library Manifesto, public libraries should provide specific services and resources to users who cannot, for whatever reason, use the regular services and resources; these may include linguistic minorities, people with disabilities, or people in hospital or prison IFLA further advocate that public libraries should provide inclusive libraries services even to ethnic minorities in order to cater for their information, educational and cultural needs (Agustin-Lacruz & Saurin-Parra, 2020) as this reflects the principle of equality of any ethnic, linguistic, and cultural group about library services. Library services provision in public libraries, particularly to the minority communities, is to preserve their cultural information and recognise their ethnic presence in order to ensure that minority groups or indigenous people can maintain their rights to access information about their culture (Akbar & Asmiyanto, 2019). Library collections meant for minority user groups must be in the languages spoken by the community, and information services that reflect the community's unique culture must be offered (Agustin-Lacruz & Saurin-Parra, 2020). However, the literature indicates that in most cases, public library users are those from the majority groups in terms of race, social class, age, and gender (Agustin-Lacruz & Saurin-Parra, 2020). This is because it has been observed that ethnic minority groups tend to have low reading interest many times (Akbar & Asmiyanto, 2019). Therefore, library resources and services should be provided for the interest of all the community groups the library serves. They should not be excluded based on their origin, background, or the views of those responsible for their creation. All community members should see themselves reflected in library resources and programs incorporating their cultures and life experiences (American Library Association Council, 2017).

In order to provide higher quality library service to marginalised communities, libraries should understand their group's features and information needs. This means that libraries should study the needs of these minority user groups and provide resources that meet their needs (Wang et al., 2018; Agustin-Lacruz & Saurin-Parra, 2020). This can be done through collaborations with local institutions to record information about local marginalised populations and investigate their information needs and how they use libraries. This will help them establish reading profiles (Wang et al., 2018).

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Libraries should invest in outreach programs as they are crucial in reaching those excluded or those who reside far from the library and information services (Muddiman et al., 2000). Libraries that reach out to those socially excluded and far away embrace a greater part of their mandate to provide information access (Hoyer, 2013). Therefore, libraries should extend their services to communities, villages and towns where most marginalised people reside. Libraries can establish service delivery in the neighbourhoods of the marginalised population, deliver books and provide special services such as computer training and learning instruction for the marginalised groups (Wang et al., 2018). For example, Shunde Library in Foshan organise a reading summer camp every year and gives children of migrant workers exceptional opportunities to receive reading promotion education. At the same time, Yat-sen Library of Guangdong Province has launched the construction of an online information navigation stop, which develops and makes use of collection resources and Internet information resources to provide the marginalised population with services such as legal consultation, employment consultation, policy consultation, and health and medical care consultation (Wang et al., 2018). Public libraries continually need to adjust their services to the features of their communities in terms of community needs and strengths to provide effective and efficient support to their communities. Hence, it is the libraries' responsibility to ensure the use of library resources and services by minority groups, including marginalised groups. (Agustin-Lacruz & Saurin-Parra, 2020.) Public libraries should be creative and innovative to provide sources of information that can be used by these particular groups (Akbar & Asmiyanto, 2019).

4 Methodology

This research used a qualitative approach and adopted a case study method to get detailed information on the provision of library and information services to the marginalised communities in Namibia. The population of this research was represented by community libraries located in the surroundings where marginalised people reside. According to Casteel and Bridier (2021), the target population is a specific group of potential participants to whom the researcher may have access that represents the nature of the population of interest. The study used purposive sampling; the libraries were purposively selected because they are situated where the most marginalised population resides. The data was collected from January to March 2023 through an open-ended questionnaire. The open-ended questionnaire was adopted because it allows participants to give detailed responses by expressing themselves freely and providing answers. In addition, Open-ended questions do not suggest responses to the participants, therefore avoiding biased information (Desai & Reimers, 2018). Thematic analysis was used to analyse and present data. Thematic analysis identifies patterns or themes within qualitative data (Maguire & Delahunt, 2017).

5 Findings

Fifteen (15) questionnaires were sent to community libraries, where most of the marginalised population resides. Of these, 14 were completed and returned.

Table:1 participant's libraries

Library name	Region	Do you have a marginalised user group in your community?	Do the marginalised people in your library's surroundings use the library services?
Rundu Community Library	Kavango East	Yes	Yes
Ndiyona Community Library	Kavango East	Yes	Yes
Nkurenkuru Community Library	Kavango West	Yes	Yes

Library name	Region	Do you have a marginalised user group in your community?	Do the marginalised people in your library's surroundings use the library services?
Kamanjab Community Library	Kunene	Yes	Yes
Opuwo Community Library	Kunene	Yes	Yes
Eenhana Community Library	Ohangwena	Yes	Yes
Okongo Community Library	Ohangwena	Yes	No
Omaheke Regional Library	Omaheke	Yes	Yes
Tsintsabis Community Library	Oshikoto	Yes	Yes
Tsumeb Community Library	Oshikoto	No	N/A
Tsumkwe Community Library	Otjozondjupa	Yes	Yes
Grootfontein Community Library	Otjozondjupa	Yes	Yes
Kabbe Community Library	Zambezi	Yes	Yes
Katima Mulilo Community Library	Zambezi	Yes	Yes

General services provided by community libraries include photocopying, scanning, printing, study/reading space, circulation of library materials, reference services, free basic computer training/literacy, children's activities, educational games, reading programs, learners' homework assistance, free computer and Internet usage, free library membership, interlibrary loan, assistance with employment application, study funding applications, and tertiary applications, CV typing, Internet and Wi-Fi access, newspapers access, database access, outreach program, educational training and workshops.

The libraries understudy provides resources such as books, dictionaries, encyclopaedias, e-resources, journals, newspapers, magazines, websites, social media platforms, pamphlets, notice boards, research databases, DVDs, government employment application forms, higher learning institutions application forms, online databases, digital sites and computers. Most of the community libraries provide their resources in print and electronic formats. Some libraries also provide information in the form of audio and videos.

Several services are provided to marginalised users, including reading space, circulation, outreach programs, free basic computer training, assistance in CV typing, job applications, university applications, study loan applications, computer and Internet access, emailing, photocopying, Wi-Fi access, scanning, and printing. In some community libraries, marginalised people mostly use photocopying services as they need copies of their documents when they apply for government social grants. Some libraries indicated that they do not offer library services specifically for marginalised users.

Various strides are made to provide library services to the users who live far from the library, which include outreach programs, the use of mobile libraries, materials taken to those who live far away from the library during visits to primary and secondary schools, Sunday schools and kindergartens, book exchange with nearby centres. Some libraries wait for users to come to the library when they need services since there are few marginalised users in some areas. At the same time, those staying far away on the farms visit the library whenever they can come to town.

Some of the measures in place that ensure that the information needs of the marginalised are met include conducting users' needs assessments and user satisfaction surveys, using a suggestion box, extending borrowing time with no penalties, and regular visits by some members. "In most cases, we know the type of services they require, and we just provide them with what they want". Another participant added that it is hard to meet their needs since they do not participate in library needs assessments.

The second objective of this research was to find out the challenges experienced in providing library services to the marginalised user groups; the respondents indicated the following challenges: The majority seems not interested in the use of the library; there is a lack of funds and transport to conduct outreach

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programs for the marginalised users who live far from the library; there is a limited number of books in marginalised indigenous languages; there is lack of content that's been produced in !kung or Ju/ 'hoansi language which make it difficult for local communities to have a sense of origination/culture/norms and practice, even story books for young children are in foreign languages. Other challenges include language barriers and the need for a translator. There are no mobile buses, "we use a normal vehicle which does not have necessary resources"; users are too lazy to visit the library as they spend most of their time at cuca shops (bars). Generally, most marginalised users do not know how to read, write, or speak English, and most of the resources are in English. They fear to learn, "When we invite them for computer training, they will not come, but they want you to type for them their CVs".

6 Discussion

Library services exclusion does not exist in Namibia. The provision of library services in Namibia is inclusive, community libraries provide their services to all Namibians, including the marginalised population as well, and this is contrary to Wang et al. (2018), who found that out of 109 libraries, 24 did not provide service for the marginalised groups. Despite the inclusiveness of library service provision, marginalised populations residing in the vicinity of Okongo Community Library do not use the library. This could be due to the low cognition level of libraries among the marginalised population (Wang et al., 2018). In situations like this, Fourie (2007) urges that libraries must determine what keeps certain user groups from using library and information services. Wang et al. (2018) insisted that libraries should change the passive service mode and enhance cooperation with social organisations to attract more marginalised people to learn about the library, walk into the library, and make use of the library.

The community libraries do not provide unique services specially meant for marginalised user groups as the services provided apply to all other library users, although these services are highly relevant. However, the findings revealed that the marginalised users used photocopying and printing services the most to photocopy and print their national documents needed to apply for social grants. These results agree with Wang et al. (2018), who found that there were libraries that were not providing specific services for the marginalised.

Most community libraries make many efforts to extend library services to the marginalised communities who live far away from the library by organising and conducting outreach programs and using mobile libraries to take the services and resources to the people. This corresponds with (Muddiman et al., 2000), who stated that libraries should invest in outreach programs as they are crucial in reaching those excluded or those who reside far from the library and information services. Other community libraries indicated that the marginalised users access library services only when they visit the library; this means these particular libraries do not make provision for taking library services to the marginalised users and to other general users who live a distance from the library.

Most community libraries use suggestion boxes and conduct user needs assessments and user satisfaction surveys to determine whether they are meeting the information needs of the marginalised users. However, in reality, it is hard to be sure that their information needs are met since the marginalised users hardly participate in library needs assessments. Some community libraries consider regular visits by some users as a means of meeting their information needs, while some libraries indicated that they already know the type of services required by the marginalised users; therefore, they provide them with what they want. This can only mean that some of these community libraries have not studied the information needs of the marginalised users in order to be in a better place to meet these users' information needs. This is why Wang et al. (2018) recommend that libraries should complete the readers' profile, including basic information, needs and interests, in order to meet the needs of a wide variety of patrons. In efforts to meet the information needs of the marginalised users, whenever they visit the town, libraries allow them to borrow as many resources as possible, which they can use for several weeks without being penalised for

late returning. Most of these users live on farms far from the library. This prevents them from regularly visiting the library, hence the particular borrowing extension. Another strategy for meeting these particular users 'needs is to exchange books with centres within reach.

As much as community libraries in Namibia are inclusive in providing their services, there are challenges when providing library services, particularly to the marginalised user groups. Community libraries have limited books in marginalised indigenous languages, and this makes it difficult for the marginalised people to have a sense of origination, culture, norms and practice. Generally, most marginalised users do not know how to read, write or speak English, and most of the community library resources are in English. This is a challenge for some marginalised users regarding the use of library resources. These findings oppose the idea of (Agustin-Lacruz & Saurin-Parra, 2020) who said that it is essential that library collections meant for minority user groups must be in the languages spoken by the community and offer information services that reflect the unique culture of the community. Another challenge is language barriers since most of the marginalised people do not know how to speak English, which is the official language, and this makes it challenging to communicate with the library staff members, especially when the library staff members do not speak the same local language as the marginalised users. To reduce illiteracy, marginalised users are invited to attend free basic computer training; however, they do not attend these trainings because there is a fear of learning amongst the marginalised users. Lack of funds and transport to conduct outreach programs for the marginalised users who live far from the library. Most community libraries do not have mobile libraries; hence, they use regular vehicles that do not have the necessary library resources and services. The findings further revealed that most marginalised people are not interested in using library services and resources. Some marginalised users are too lazy to visit the library and spend most of their time at cuca shops (bars) instead.

7 Conclusion

To answer this research article's problem, there is no library services exclusion as library services provision in Namibia is extended to the marginalised population even though, from the findings, the library usage of the marginalised groups seem to be minimal. Most of the community libraries use suggestion boxes and conduct user needs assessments and user satisfaction surveys to determine whether they are meeting the information needs of the marginalised users even though, in some instances, it is difficult as the marginalised users hardly participate in these assessments. Community libraries have limited books in marginalised indigenous languages, which could hinder meeting the marginalised users' information needs. Community libraries bring services closer to the people through outreach programs and mobile libraries. There are, however, challenges as they experience a lack of funds and transport to conduct outreach programs for the marginalised users who live far from the library. Most community libraries do not have mobile libraries; hence, they use regular vehicles that do not have the necessary library resources and services.

8 Recommendations

Based on the findings, the following were recommended:

- Library collections should be developed with marginalised populations in mind, for inclusiveness.
- The ministry responsible for community libraries should ensure the provision of adequate funds to carry out outreach programs.
- Some community libraries should abandon the notion that users must come to the library and introduce the notion of 'taking library services to the people'.
- To increase the use of libraries by marginalised populations, community libraries should make more efforts to publicise and promote themselves.
- More user profiling must be implemented to ensure libraries meet users' information needs.

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9 Recommended further research

Further research should focus on the access and use of library services by marginalised communities and the information-seeking behaviour of the marginalised population in Namibia to understand the reasons for minimal library service use.

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27. Information Behaviour of African Immigrants in Sunnyside, Pretoria, South Africa

Marjorie Mandu Molaudi
University of South Africa
molaumm@unisa.ac.za

Abstract

The information or knowledge-driven dispensation is characterised by continual information seeking, acquisition, sharing and use. These continuous information-seeking activities constitute what is referred to in the study as information behaviour. Information is essential for individual growth and survival as it helps people address different aspects of life. The intended purpose of this study is to explore the information behaviour of African immigrants residing in Sunnyside, Pretoria. This qualitative study focuses on how immigrants go about seeking information that could support them in addressing various challenges affecting their everyday lives. There is a need for librarians and information service providers to understand better the information behaviour of African immigrants living in Sunnyside, Pretoria. The immigrants form a diverse group of information users because they come from different African countries, speak different languages and have diverse cultural beliefs. A better understanding of the immigrants' information behaviour is necessary to enable information service providers to develop specialised information services for this unique user group.

Keywords: *Information behaviour, information services, information risks, digital information*

1 Introduction

The information-driven dispensation is characterised by continual information seeking, acquisition, sharing and use. These continuous information-seeking activities constitute what is referred to in the study as information behaviour. Information behaviour - "the totality of human behaviour about sources and channels of information, including both active and passive information seeking and information use" (Wilson, 2000, p. 49). Information is vital for individual growth and survival (Yusuf, 2012). Silvio (2006, p. 261) highlights the importance of information for people in addressing different aspects of life. Librarians or information service providers need to understand users' information needs better. A better understanding of the information needs and seeking behaviour is necessary to enable information service providers to develop specialised information services for this user group. This study focused on one unique group of information users - African immigrants living in the suburb of Sunnyside, Pretoria, South Africa.

Human migration is a global phenomenon. Khoir et al. (2015) state some reasons why people emigrate from their mother countries. People may emigrate intentionally due to the need to pursue professional goals. Others may move to join the spouse or family, whereas some are forced to move because of instability in their home countries, such as war and/or poverty. Migration is a powerful adaptive strategy for humans to navigate hardship and pursue a better quality of life. Migration contributes largely to globalisation as it is a universal vehicle facilitating the exchange of "ideas, culture, money, and goods" (Davis et al., 2013).

2 Research problem

Immigrants find moving to a new country challenging in many ways. The challenges cited include social exclusion, prejudice, lack of employment, social networks, and unfamiliarity with local languages and customs (Caidi et al., 2010; Qayyum et al., 2014). Upon arrival in a new country, immigrants need critical information to help them settle in the new environment (Muhambe, 2018; Papillon, 2002; Shoham & Strauss, 2007).

The information behaviour of African immigrants residing in Gauteng Province is generally unknown as no prior studies are known to the researcher. Furthermore, there are no libraries and information services in Sunnyside. There is a lack of provision of specialised information services for African immigrants living in Sunnyside to fulfil their inherent information deficiencies in order to address the challenges of adapting to a foreign country, life, and society. This paper explores the information behaviour of African immigrants living in the suburb of Sunnyside, Pretoria, primarily focusing on how they deal with their day-to-day information needs, seeking, accessing, sharing, and using.

The specific objectives of the paper are to explore the contexts that raise the information needs of the African immigrants, uncover the factors that determine the African immigrants' information-seeking behaviour, determine the information sources that the African immigrants in Sunnyside rely on to meet their various information needs; extricate the existence of risks or rewards in their information seeking activities; and propose an information provision model that would conceptualise the information behaviour prevalent in African immigrants in South Africa as they deal with their day-to-day information needs, seeking, access, sharing, and use.

3 Theoretical framework
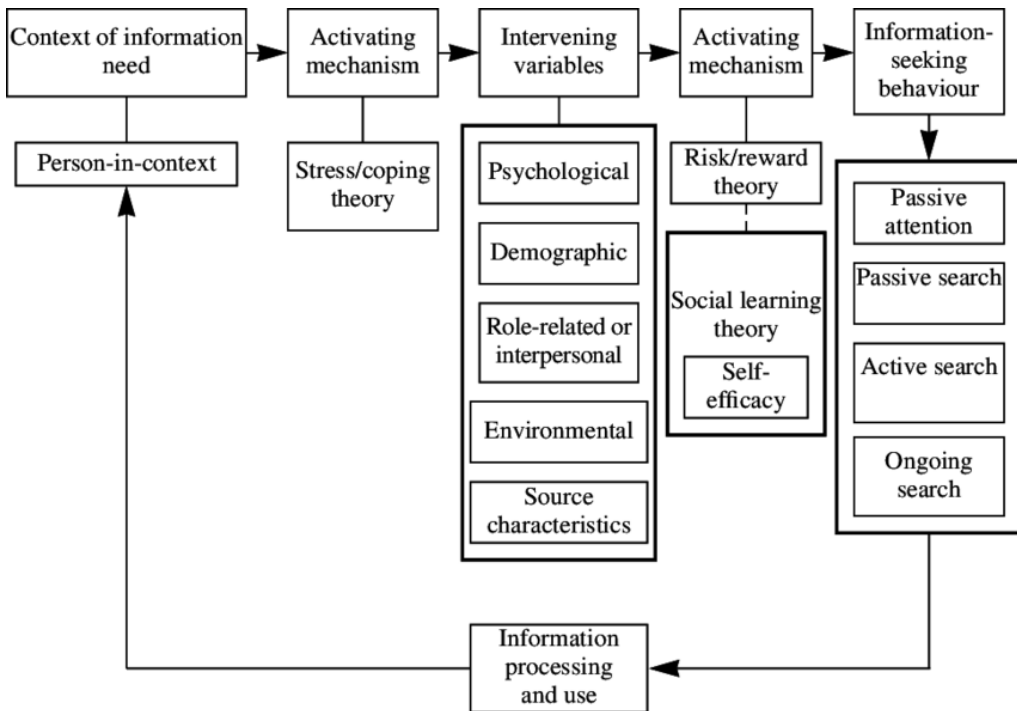
Figure 1 Wilson's (1996) model of information behaviour

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4 Literature review
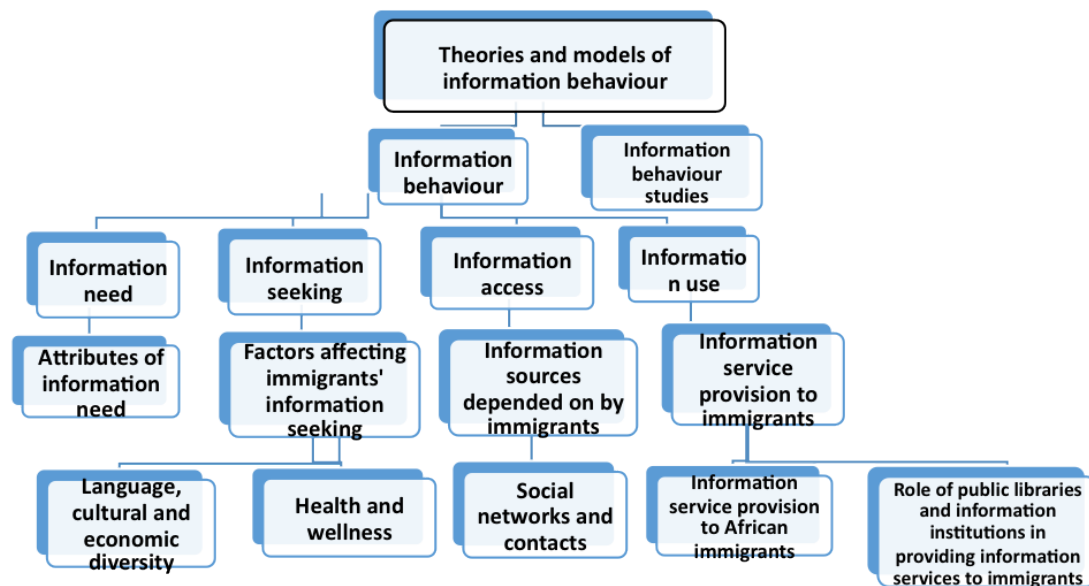
Figure 2: Literature review road map for the study

5 Research methodology

Table 1: Research methodology for the study

Research paradigm	Ontology, epistemology
Ontology	Constructivism
Epistemology	Interpretivist
Research approach	Qualitative approach
Research design	Narrative inquiry
Target population	African immigrant households
Sampling strategy	Snowball sampling; convenience sampling
Data collection method	Interviews
Data analysis and presentation	Thematic (key aspects), restoring/reorganising (retelling - sequential, chronological), identifying significant patterns

6 Findings, discussion and conclusions

6.1 Push and pull factors influencing African immigrants' information-seeking behaviour.

Job and educational opportunities, affordability, safety for foreigners, survival, convenience, joining friends and relatives, and medical reasons.

6.2 The contexts that expose the information needs of African immigrants

African immigrants' information needs upon arrival in Sunnyside include information on career and personal development, immigrant residence legislation, business opportunities, other opportunities for

survival, lifestyle and navigation. New immigrants need information on where to find helpful information, safety precautions, navigation and survival, financial stability, and perception of South Africa.

6.3 Information sources are commonly used by African immigrants in Sunnyside to meet their various information needs.

Relatives, friends, acquaintances, the Internet, Audiovisual media, digital social networks, and media are among African immigrants' new information needs, which include training and development, trading, residence documentation, recreational facilities, business expansion, collaboration, and investment opportunities.

6.4 Risks in African immigrants' information-seeking activities

- **Participants' information expectations upon arrival** - City information office at the port of entry, abundance of jobs in the city, prompt information acquisition, access to state-funded services, violence.
- Language and culture, social exclusion, a lack of knowledge of immigrants' rights, and a lack of skill sharing between locals and immigrants are challenges experienced in information seeking.
- **Essential information that is hard to acquire** - Current economic situation, job opportunities and new companies, Africa Free Trade Agreement, safe and secure accommodation.
- **Information that African immigrants are hesitant to request** is location information, health information, skills sharing, information about new business ideas, and street trading licenses.

6.5 The status of information provision to African immigrants in Sunnyside

Lack of libraries, information services provision centres, and other essential services pertaining to residency.

7 Recommendations

- Incorporate some elements that are missing from Wilson's model, such as how affective factors (emotions and feelings) influence human information-seeking behaviour.
- Since Sunnyside has no library or information service, such a facility should be established. This could be done by utilising a readily available building that can be used as a library or information centre that provides specialised information services to African immigrants - relevant immigration websites, immigrant documentation and resources, laws governing trading, free unlimited Internet connectivity, city information, readers in Sepedi and Setswana (local languages) and information on the Africa Free Trade Agreement.
- The envisaged library or information centre should be tasked to provide immigrants with free unlimited access to Internet connectivity.
- The envisaged information services should be linked to the municipal website of the City of Tshwane. In relation to this, the City of Tshwane municipal library must be advised to establish the city information office at the port of entry into the city of Pretoria.
- The proposed library and information services can offer local language services, including readers in Sepedi and Setswana for immigrants.
- The proposed library or information centre should provide information literacy skills to less-skilled African immigrants.
- Since it is evident that human migration is a global phenomenon, the LIS curriculum must be expanded to incorporate immigrant studies.

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28. Awareness of Linked Data Among Professional Librarians in Uganda

Winny Akullo*; Zawedde Nsibirwa**

University of KwaZulu-Natal

*winny.nekesa@yahoo.com; **nsibirwaz@ukzn.ac.za, ORCiD: 0000-0001-8527-1560

Abstract

Linked Data (LD) is one of the emerging technological innovations in a massively networked information space. Linked Data enables published information to be interlinked with other information on the Web, increasing library resources' visibility. Libraries provide authoritative information because they are custodians of bibliographic information. However, this information is kept in silos and not shared. This study aimed to determine the level of awareness of Linked Data technologies among professional librarians in Uganda. The Unified Theory of Acceptance and Use of Technology (UTAUT) underpinned the study using the Facilitating Conditions (FC) and Social Influence (SI) constructs. The targeted population was 145 professional librarians in 14 purposively selected universities because they had adopted integrated library management systems. An online questionnaire was used to collect quantitative data from the professional librarians. The data was analysed using SPSS. The positivism paradigm was adopted for the study because it is associated with the quantitative research approach. The study revealed that most university librarians knew the Linked Data concept and its best practices for publishing, sharing and interlinking structured data on the Web. However, the respondents indicated they were unaware that their universities had acquired the necessary infrastructure to facilitate data sharing among other universities. The study recommends that librarians be proactive, especially regarding technological infrastructure and services that affect the library. They also need to participate in seminars and workshops to keep abreast with the current landscape in a library environment, upskilling and reskilling, and form a community of librarians for updates in the library field.

Keywords: *Linked data, Web of Documents, semantic Web, metadata management, Uganda*

1 Introduction

The Web has evolved from a global information space of linked documents to documents and data (Bizer et al., 2009). This evolution is underpinned by a set of best practices for publishing and connecting structured data on the Web known as Linked Data (Bizer et al., 2009). The concept of Linked Data and the Semantic Web has gained importance in revolutionising the world of the Internet (Sankha-Subhra & Arpita, 2019). Linked Data enables published information to be interlinked with other information on the Web, increasing library resource visibility (Gaitanou et al., 2022). One of the critical principles of Linked Data is to publish structured data on the Web so that digitised materials, including the catalogue data, can be accessed through web search engines (Okoroma, 2023). Libraries provide authoritative information because they are custodians of bibliographic information; however, this information is kept in silos and not shared. However, Linked Data can play a significant role in libraries when their highly treasured wealth of knowledge and hidden data are interlinked with the Web for better global accessibility.

Data is becoming more complex, and effective management and sharing of large datasets are challenges for libraries (Ali & Warraich, 2018). Therefore, to make library data accessible, the organisation and integration of this data are vital (Eslami & Vaghefzadeh, 2013). In the Web of Documents, the catalogues of libraries are usually inaccessible through search engines (Warraich & Rorissa, 2018). While most users begin their search for information through search engines, these search engines cannot search library resources. Thus, some libraries in developed countries have converted their library bibliographic information or metadata to Linked Data (Ali & Warraich, 2018). In developing countries, the adoption of Linked Data has not been promising because of a general lack of awareness and technical staff with knowledge of these emerging

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technologies (Hallo et al., 2014; Mulumba et al., 2017). University libraries in Africa and other developing countries should use Linked Data and make their library data accessible on the Web, where users can easily find it (Godby & Smith-Yoshimura, 2017; Gonzales, 2014).

According to Faith and Chrzanowski (2015), Linked Data is still new to many librarians, and some may not even be aware of it. However, Linked Data provides an excellent solution for creating, sharing, harvesting and using information in Web-based environments (Mitchell, 2013). This was also confirmed by Saleem et al. (2018) that knowledge and awareness of Linked Data is still an issue and requires an institutional willingness to share data. Librarians generally lack knowledge, experience and success stories about Linked Data that may be used for their libraries (Hallo et al., 2014).

Similarly, Ali and Warraich (2018) confirmed that librarians still have a low awareness of Linked Data. The authors, therefore, proposed that conferences, seminars and workshops related to Linked Data in libraries should be conducted to increase the awareness of Linked Data among library professionals. Conferences, seminars, and workshops will motivate them to adopt and implement the technology easily, which is especially needed in developing countries (Ali & Warraich, 2018, p. 935).

Niu (2020) noted that although some librarians have heard about the term and concept of Linked Data through various communication channels such as literature and conferences, there is still a general lack of awareness of the basic concepts of Linked Data and the Semantic Web among librarians and information professionals. Byrne and Goddard (2010) and Warraich and Rorissa (2018) echoed similar views. To develop and work with non-library ontologies, librarians must collaborate with IT professionals to help fulfil their library needs (Warraich & Rorissa, 2018).

On the contrary, a study by LaPolla (2013) in the United States showed that most academic librarians surveyed were somewhat familiar with key Semantic Web terms. The author argued that this apparent awareness of critical concepts among a segment of librarians highlights the opportunity to move towards more practice research than education efforts (LaPolla, 2013). LaPolla (2013) pointed to the need for increased dialogue between cataloguers, technical service professionals, and institutional administrators regarding the potential for these technologies to play a transformative role in the academic library.

The George Washington University Libraries cataloguing staff and programmers had insufficient expertise in Linked Data at the beginning of their experimental project with the technology (Shieh & Reese, 2015). However, through countless webinars, workshops and exercises, the cataloguing staff learned how to tease MARC data and repackage it in RDF triples (Shieh & Reese, 2015). To keep abreast of Linked Data initiatives, some university libraries (for example, the University of Nevada Las Vegas and the University of Florida) have created Linked Data study groups (Niu, 2020).

The literature reviewed shows a general lack of awareness among the Library and Information professionals, which must be overcome. Therefore, this research examines the level of awareness of Linked Data among professional librarians in Uganda. The general objective of this study is to find out the level of awareness of Linked Data among Uganda's library and information professionals.

2 Theoretical background

This study is underpinned by the Unified Theory of Acceptance and Use of Technology (UTAUT) theory. The UTAUT theory was developed by Venkatesh et al. (2003). The UTAUT model provides a comprehensive framework for understanding the factors influencing technology adoption and usage (Venkatesh et al., 2003). The UTAUT theory has been extensively adapted and adopted in investigating the general acceptance and usage of ICT in different environments (Tibenderana & Ogao, 2008; Zhou et al., 2010). The UTAUT model has four direct determinants that include performance expectancy (PE), effort expectancy (EE),

social influence (SI), and facilitating condition (FC) to measure both behavioural intention and the actual behaviour of users to use an information system (Venkatesh et al., 2003). The study adopted two UTAUT constructs, namely facilitating conditions and social influence. FC is defined as the degree to which an individual believes that organisational and technical infrastructure exists to support the use of the system. FC was examined to find out if it influences the level of awareness of Linked Data towards the adoption of Linked Data among professional librarians. SE is the degree to which an individual perceives the importance of the social environment in the use and adoption of a new system. The social influence was examined to establish the external factors influencing professional librarians' adoption of Linked Data.

3 Methodology

The study employed a quantitative research approach associated with the positivism paradigm (Sarantakos, 2005, p. 34). According to Creswell (2013), the positivism paradigm is used by researchers to apply a quantitative method of data collection to best answer the research questions. An exploratory research design was adopted for this study because it is considered appropriate for studies with limited developments (Creswell & Plano-Clark, 2007). The data was collected using an online questionnaire. The Statistical Package for Social Sciences (SPSS) was used to analyse the data. Fourteen universities were purposively selected because they adopted integrated library systems (see Table 1). The study population was purposively selected: 145 professional librarians were selected because they support the academic departments in the universities. Out of the 145 expected respondents who were emailed the questionnaire, 122 responded, giving a response rate of 84.1%.

4 Findings

The findings present the respondents' demographic details, including their distribution by institution and educational qualifications. The findings further present the respondents' responses on their level of awareness of Linked Data

4.1 Demographic characteristics of respondents

Table 1 below shows the distribution of the respondents by their distribution of respondents by institution.

Table 1: Distribution of respondents by institution (n=122)

Name of Institution	Frequency	Percent (%)
Makerere	21	17.2
Kyambogo	14	11.5
Busitema	8	6.6
Kabale	11	9.0
Lira	2	1.6
Muni	2	1.6
Gulu	10	8.2
Ndejje	7	5.7
Nkumba	4	3.3
UCU	15	12.3
UMU	8	6.6
Cavendish	4	3.3
KIU	13	10.6
CIU	3	2.5
Total	**122**	**100**

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From Table 1 above, the highest number of respondents of this study were from Makerere University 21(17.2%), followed by Uganda Christian University (UCU) 15 (12.3%); Kyambogo University 14 (11.5%); Kampala International University 13 (10.6%); Kabale University 11 (9%); Gulu University 10 (8.2%); Busitema University 8(6.6%); Uganda Martyrs University 8 (6.6%). On the other hand, the universities of Ndejje University were 7 (5.7%), Nkumba University 4 (3.3%), and Clarke University 3(2.5%). While Lira and Muni had the lowest number of respondents, with each having two (1.6%).
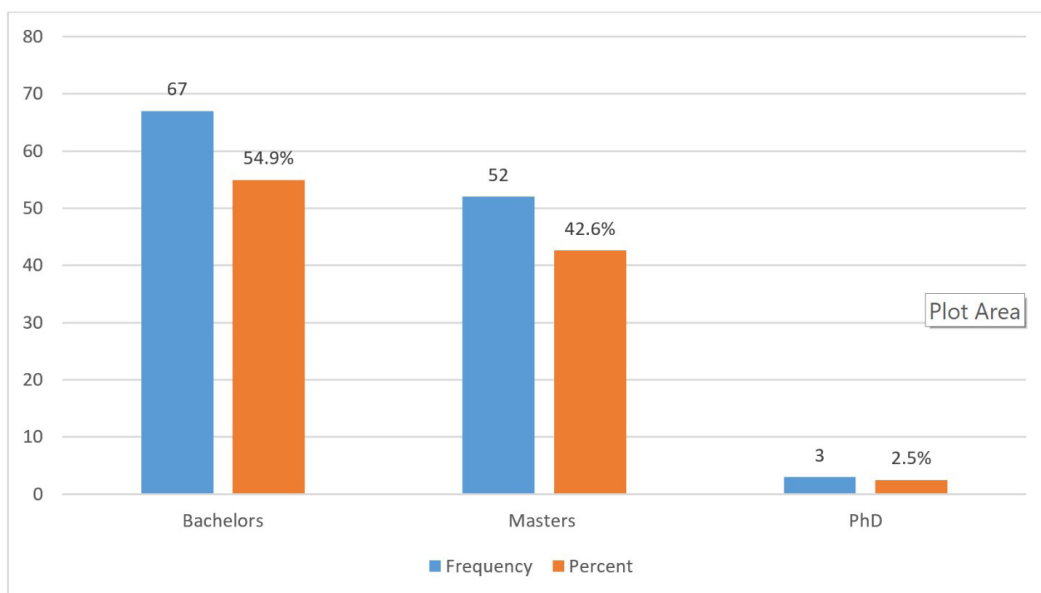
Figure 1: Respondents by educational qualifications

Figure 1 above shows that the majority of the respondents, 67 (54.9%), have a bachelor's degree as the highest education qualification, 52 (42.6%) have obtained a master's degree, and only 3 (2.5%) have attained a PhD.

4.2 Awareness of Linked Data among professional librarians

The study sought to determine the respondents' awareness of Linked Data technologies using the UTAUT constructs, namely facilitating conditions and social influence. The responses from the 122 professional librarians are presented in Table 2 below. The respondents were asked to indicate their answer for each variable according to whether they seriously disagreed (SD), disagreed (D), did not agree or disagreed (NA/D), agreed (A) and strongly agreed (SA).

Table 2: Awareness of Linked Data among the professional librarians (n=122)

Statements Facilitating Conditions	SD		D		NA/D		A		SA		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
I am aware of the Linked Data concept	9	7.4	9	7.4	18	14.8	71	58.2	15	12.3	122	100
I am aware that Linked Data offers best practices for publishing structured data on the Web	3	2.5	6	4.9	32	26.2	60	49.2	21	17.2	122	100
I am aware Linked Data offers best practices for sharing structured data on the Web	6	4.9	6	4.9	19	15.6	66	54.1	25	20.5	122	100

Statements Facilitating Conditions	SD		D		NA/D		A		SA		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
I am aware that Linked Data offers best practices for interlinking structured data on the Web	3	2.5	7	5.7	23	18.0	70	57.4	19	15.6	122	100
I am aware that some university libraries have adopted Linked Data for their data sharing and reuse	3	2.5	11	9.0	25	20.5	65	53.3	18	14.8	122	100
Social Influence	SD		D		NA/D		A		SA		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
I am aware that the university has acquired the necessary infrastructure to facilitate the data sharing among other universities	8	6.6	22	18.0	32	26.3	51	41.8	9	7.4	122	100
I am aware of the university library's use of URIs to link data to explore information referenced and interconnected on the Web	9	7.4	18	14.8	30	24.6	55	45.1	10	8.2	122	100
I am aware of the university library's use of the web interface to enable patrons to find and search published datasets.	4	3.3	14	11.5	23	18.9	65	53.3	16	13.1	122	100
I am aware that the university library needs to use the Web of Data to enable access and sharing of data with users without barriers	4	3.3	3	2.5	14	11.5	71	58.2	30	24.6	122	100
I am aware that my institution needs to support global efforts to make data available, accessible, and usable for unrestricted use worldwide	2	1.6	3	2.5	19	15.6	61	50.0	37	30.3	122	100

4.2.1 Facilitating conditions

Facilitating conditions examined how it influences the level of awareness of Linked Data among professional librarians. This was based on four variables: awareness of the linked Data concept, Linked Data best practices for publishing structured data on the Web, Linked Data offers best practices of interlinking structured data on the Web, and some university libraries have adopted Linked Data for data sharing and reuse.

The study sought to determine how the facilitating conditions influenced the level of awareness of Linked Data among professional librarians. According to Table 2, the majority of the respondents, 60 (49.2%), agreed that they were aware of the Linked Data concept; 32 (26.2%) neither agreed nor disagreed; 21 (17.2%) strongly agreed; six (4.9%) disagreed; and three (2.5%) strongly disagreed. Thus, an overall majority of respondents, 66.4%, responded positively.

Similarly, over half, 66 (54%) of the respondents agreed that they were aware that Linked Data offers best practices for sharing structured data on the Web; 25 (20.5%) strongly agreed; 19 (15.6%) neither agreed nor disagreed; while six (4.9%) strongly disagreed, and six (4.9%) disagreed. Thus, 70.5% of the respondents agreed that Linked Data offers best practices for sharing data on the Web.

70 (57.4%) respondents agreed that Linked Data offers best practices for interlinking structured data on the Web. This was followed by 22 (18%) of the respondents who neither agreed nor disagreed; 19 (15.6%) strongly agreed; seven (5.7%) disagreed; and four (3.3%) strongly disagreed. Thus, most of the 73% agreed that they were aware of Linked Data's best practices for sharing data on the Web.

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Finally, just over half, 65 (53.3%) of the respondents, agreed that they were aware that some university libraries had adopted Linked Data technologies for data sharing and reuse. 25 (20.5%) neither agreed nor disagreed; 18 (14.8%) strongly agreed; 11 (9.0%) disagreed; and three (2.5%) strongly disagreed. Thus, the majority, 68.1%, responded positively.

4.2.2 Social influence

Social influence was regarded as awareness about the university's infrastructure acquisition, using the university library's URIs to link data, and the Web interface enabling patrons to find and search published datasets. The results are presented in the second half of Table 2 above.

According to the findings, the majority of the respondents, 52 (41.8%), knew that the university had acquired the necessary infrastructure to facilitate data sharing among other universities. 32 (28.2%) of the respondents neither agreed nor disagreed; 22 (18.0%) disagreed; nine (7.4%) strongly agreed and eight (6.6%) strongly disagreed. From the findings, the majority, 52.8%, responded negatively, thus indicating that the respondents were unaware that the university had acquired the necessary infrastructure to facilitate data sharing among other universities.

Furthermore, just over half, 65 (53.3%) of the respondents agreed that they were aware of the university library's use of the Web interface to enable patrons to find and search published datasets. 23 (18.0%) neither agreed nor disagreed; 16 (13.1%) strongly agreed; 14 (11.5%) disagreed; and four (3.3%) strongly disagreed. Thus, the majority, 64.8%, agreed.

Similarly, the majority, 71 (58.2%) of the respondents, agreed that they were aware of the university library's need to use the Web of Data to enable access and sharing of data with users without barriers; 30 (24.6%) strongly agreed; 14 (11.5%) neither agreed nor disagreed; four (3.3%) strongly disagreed; and three (2.5%) disagreed. Thus, the majority, 82.8%, responded positively.

Finally, half of the 61 (50%) agreed that they were aware that their institutions needed to support global efforts to make data available, accessible, and usable for restricted use worldwide. 37 (30.3%) strongly agreed, while 19 (15.6%) neither agreed nor disagreed, four (3.3%) strongly disagreed, and three (2.5%) disagreed.

5 Discussion of the findings

The findings revealed that 54.9% of the respondents had attained a bachelor's degree as the highest education qualification, while 52 (42.6%) had attained a master's degree. This implies that the majority of librarians have sufficient skills to facilitate the adoption of Linked Data technologies, which will enhance data sharing and reuse.

The findings further revealed that most of the respondents, 66.7%, were aware of the Linked Data concept, while 33.3% were not. The study revealed that most respondents knew that Linked Data offers best practices for publishing, sharing, and interlinking structured data on the Web. In addition, the respondents were aware that some university libraries have adopted Linked Data for their data sharing and reuse. In all instances, only a few respondents disagreed or gave neutral responses regarding the conditions facilitating Linked Data's awareness. The study, therefore, revealed that most professional librarians in Uganda know the Linked Data concept and what it offers.

This finding contradicts the literature; a study by Ali and Warraich (2018) noted that librarians still have a low awareness of Linked Data. Low levels of awareness of Linked Data were confirmed by Warraich and Rorissa (2018), that a general lack of awareness of the basic concept of Linked Data and the Semantic Web and best practices for these emerging technologies still exists among Pakistani librarians and information professionals. Some librarians have heard about the term and concept of Linked Data through various

communication channels, such as conferences and workshops (Niu, 2020). Byrne and Goddard (2010) also noted that the concept of Linked Data and its semantics have not yet reached the consciousness of many librarians. Faith and Chrzanowski (2015) indicated that Linked Data is still new to many librarians, and some may not even be aware of it. Librarians lack knowledge, experience, and success stories concerning Linked Data that may be used for their libraries (Hallo et al., 2014). Similarly to Niu (2020), Ali and Warraich (2018) proposed that conferences, seminars, and workshops related to Linked Data in Libraries should be conducted to make library professionals aware and motivated to adopt the emerging technology. This is because Linked Data provides a solution to how information can best be created, shared, harvested, and used in Web-based environments (Mitchell, 2013).

The findings further revealed that most respondents, 52.8%, were unaware that their universities had acquired the necessary infrastructure to facilitate data sharing with other universities. A study by Hannemann and Kett (2010, p. 4) revealed that technological options for Linked Data technologies are still in development with poor documentation that other institutions may use to adopt and implement Linked Data. Hawkins (2022) recommends using Wikidata, a Wikimedia Foundation project, to overcome some infrastructure challenges that developing countries like Uganda can adopt. For example, the Penn University Libraries have added their collections to Wikidata (Ortenberg, 2021). Linking library collections to Wikidata enhances rich results and connections to repositories, increasing visibility and establishing a solid online presence (Garoufallou & Papatheodorou, 2014).

6 Conclusion and recommendations

The study examined the level of awareness of Linked Data among professional librarians in Uganda using the facilitating conditions and social influence of UTAUT constructs. The study's findings revealed that professional librarians were aware of the Linked Data concept and what it offers regarding sharing, publishing, and interlinking of data. The study also found that most respondents were unaware that their institutions were acquiring the technological infrastructure vital to adopting and implementing Linked Data.

The study recommends that librarians be proactive, especially regarding technological infrastructure and services that affect the library. Hawkins (2022) recommends using Wikidata, a Wikimedia Foundation project, to overcome some infrastructure challenges that developing countries like Uganda can adopt. There is a strong need to spread awareness of the potential of Linked Data within the library environment (Cagnazzo, 2017). Librarians need to participate in conferences, seminars and workshops to keep abreast with the current landscape in the library environment, in addition to upskilling and reskilling and also form a community of librarians for updates in emerging trends and technologies in the library field. Cagnazzo (2017) indicated a strong need to spread awareness of the potential of Linked Data within the library environment.

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29. The Role of Internet of Things in Shaping TVET Libraries in Kenya

Benjamin Opicho Kemboi*; Kentrone Mercy Ayilo**

Technical University of Kenya.
benjamin.kemboi@tukenya.ac.ke

**University of Pennsylvania*
amercykentrone@gmail.com

Abstract

This study delves into the transformative role of the Internet of Things (IoT) in Technical and Vocational Education and Training (TVET) libraries in Kenya. Guided by the objectives of assessing feasibility, examining impact, and identifying challenges and opportunities, the research employs a content analysis methodology. Content analysis is applied to various existing documents, reports, and digital resources about IoT technology integration in TVET libraries. The findings unearth a comprehensive understanding of the current landscape and potential advancements related to IoT in TVET libraries. Analysis of literature, policy documents, and case studies reveals the feasibility of IoT integration and the multifaceted benefits it offers, including enhanced resource management, improved security, and increased accessibility. In conclusion, the research underscores the potential of IoT to revolutionise TVET libraries, aligning them with contemporary educational paradigms. The study recommends phased IoT adoption, beginning with pilot programs and scaled implementation. These recommendations, informed by content analysis, also emphasise the importance of infrastructure investment to address data security concerns and ensure IoT technology's safe and efficient adoption. In effect, this study contributes to the ongoing discourse on educational reform. It guides Kenya's TVET sector as it embarks on a journey to leverage IoT for a technology-driven future.

Keywords: *Internet of Things, vocational training, 4IR, technology acceptance, diffusion of innovations*

1 Introduction

Integrating the Internet of Things (IoT) in educational settings is a global trend toward more interconnected and technologically advanced learning environments. Globally, the application of IoT in libraries is transforming traditional spaces into dynamic hubs of digital learning and resource management. For instance, in developed countries, IoT is increasingly employed in libraries for automated check-ins, real-time access to book availability, and enhanced security systems (Smith & Chang, 2021). These technological advancements have significantly improved user experience and operational efficiency.

Regionally, across Africa, there is growing interest in harnessing the potential of IoT to overcome educational challenges and bridge the digital divide. Several African nations are exploring IoT to enhance educational access and administrative efficiency in vocational training centres. However, the adoption rates vary widely due to differing levels of infrastructure development and investment in technology across the continent.

In Kenya, the focus on technical and vocational education and training (TVET) libraries reflects a targeted approach to leveraging IoT to support vocational education. The Kenyan government has identified IoT as a critical component of its digital strategy for education, aiming to enhance resource accessibility and operational efficiency in educational institutions (Kenya Ministry of Education, 2023). Adapting IoT technologies in Kenyan TVET libraries is crucial to modernising education and aligning it with labour market needs.

However, the local implementation of IoT in Kenyan TVET libraries faces unique challenges, including limited technological infrastructure, funding constraints, and a need for skills training among library staff (Omondi & Kituyi, 2022). Despite these challenges, there are significant opportunities for IoT to make a

substantial impact. Enhanced connectivity and smart technology can facilitate better management of library resources, improve security, and provide students with a more interactive and engaging learning environment.

In addition, the global, regional, and local perspectives highlight both the potential and the challenges of implementing IoT in TVET libraries. By aligning with global trends and addressing regional needs and local challenges, Kenya can effectively enhance its educational infrastructure and prepare its workforce for the future.

2 Research problem

Integrating the Internet of Things (IoT) in Technical and Vocational Education and Training (TVET) libraries represents a significant shift towards digital transformation in education. However, despite its potential, the adoption of IoT in Kenyan TVET libraries faces many challenges that hinder its effective implementation. The problem revolves around infrastructural deficiencies and a lack of comprehensive strategies to harness IoT capabilities fully.

One of the primary issues is the inadequate technological infrastructure within many Kenyan educational institutions (Omondi & Kituyi, 2022). The existing library systems are often outdated and not equipped to support IoT technologies, which include real-time data processing and connectivity solutions. This infrastructural gap not only limits the feasibility of IoT implementation but also affects the reliability and effectiveness of such initiatives.

Moreover, library personnel and educational staff have a significant skill gap in managing and maintaining IoT systems. Without adequate training and knowledge, the sustainability of integrating advanced technologies such as IoT becomes problematic (Smith & Chang, 2021). This lack of expertise can lead to underutilising installed technologies and failing to achieve the intended educational enhancements.

Additionally, there are concerns regarding data security and privacy, which are paramount in IoT. As libraries increasingly digitise their resources and operations, they become more vulnerable to cyber threats, necessitating robust security protocols that many Kenyan TVET libraries cannot handle.

Thus, while the potential of IoT to transform TVET libraries in Kenya into more efficient, responsive, and modernised learning environments is recognised, significant challenges need to be addressed to realise this technology's benefits fully. Addressing these issues is critical to overcoming barriers to IoT adoption and ensuring that the integration of such technologies contributes positively to the educational goals of TVET institutions.

The study's objectives were to explore the feasibility of integrating IoT technology in TVET libraries in Kenya, examine the impact of IoT on TVET libraries, and explore the challenges and opportunities associated with IoT integration in TVET libraries.

This study examines the integration of the Internet of Things (IoT) within Technical and Vocational Education and Training (TVET) libraries in Kenya. It aims to assess the feasibility of IoT adoption, investigate its impact on library services and operations, and identify the inherent challenges and opportunities. The study confines itself to analysing existing documents, reports, and case studies related to IoT applications in Kenyan educational libraries, thereby providing insights into how IoT technology can be leveraged to enhance educational outcomes and library management in the context of Kenya's TVET institutions.

This study is significant as it explores the transformative potential of the Internet of Things (IoT) in enhancing the functionality and service delivery of TVET libraries in Kenya. The study provides valuable insights for policymakers, educators, and library administrators by assessing IoT integration's feasibility, impact, and challenges. It offers a foundational understanding of the strategic implementation of IoT technologies, which can lead to improved resource management, security, and accessibility in educational

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settings. Ultimately, the findings will contribute to the broader discourse on educational technology in Kenya, supporting the nation's goals for digital transformation in the education sector.

This study is justified as it addresses the urgent need for modernisation in Kenyan TVET libraries by adopting IoT technologies. With the rapid evolution of digital learning tools and increasing demands for technologically-equipped educational environments, this research is timely in evaluating how IoT can specifically benefit TVET institutions. It fills a crucial gap in the existing literature by providing detailed insights into the operational, educational, and security enhancements IoT can offer. Additionally, the study's outcomes will inform strategic decisions regarding infrastructure investments and policy formulations necessary for embracing IoT, thereby fostering a tech-driven educational landscape in Kenya.

3 Theoretical framework

Two theories—the Diffusion of Innovations Theory and the Technology Acceptance Model—underpinned the study. These are described hereunder.

3.1 Diffusion of Innovations Theory

Diffusion of Innovations Theory, developed by Everett Rogers in 1962, is a crucial model for understanding how new ideas and technologies spread through different cultures and organisations over time. According to Rogers (2003), the theory delineates the process by which an innovation is communicated through specific channels over time among the members of a social system. It emphasises five attributes of innovations that can influence an individual's decision to adopt or reject an innovation: relative advantage, compatibility, complexity, trialability, and observability.

The theory categorises adopters into five groups based on their speed of adoption: innovators, early adopters, early majority, late majority, and laggards. Innovators are willing to take risks, followed by early adopters and social leaders. The early and late majorities are more sceptical and adopt the technology once its advantages are well-known and proven. Laggards are the last to adopt an innovation and are typically resistant to change.

This theory helps to identify the barriers and facilitators affecting the uptake of new technologies, such as IoT in TVET libraries, in the context of technology adoption in educational settings. By understanding these factors, institutions can tailor strategies that enhance the adoption process and ensure the successful integration of new technologies.

3.2 Technology Acceptance Model

The Technology Acceptance Model (TAM), proposed by Fred Davis in 1986, is a widely used framework for understanding and predicting users' acceptance and adoption of new information technologies. TAM posits that perceived usefulness and ease of use are critical determinants of an individual's intention to use technology, influencing actual usage behaviour (Davis, 1989). Perceived usefulness refers to the user's perception of the degree to which technology enhances their job performance or productivity, while perceived ease of use refers to the user's perception of the effort required to use the technology effectively.

TAM suggests that these two factors collectively determine users' attitudes towards technology, ultimately shaping their behavioural intention to use it. Moreover, TAM argues that external variables, such as social influence and facilitating conditions, can also impact users' perceptions and intentions.

In the context of educational technology adoption, TAM provides valuable insights into the factors influencing educators' and learners' acceptance of new technologies like IoT in TVET libraries. By understanding users' perceptions of usefulness and ease of use, educational institutions can design interventions and provide support mechanisms to enhance technology acceptance and utilisation.

4 Methodology

The methodology of this study involves employing a content analysis approach to investigate the integration of the Internet of Things (IoT) in Technical and Vocational Education and Training (TVET) libraries in Kenya. Content analysis will be conducted on existing documents, reports, and case studies related to IoT applications in TVET libraries. This approach systematically examines the feasibility, impact, challenges, and opportunities associated with IoT integration in TVET libraries. By analysing existing literature and resources, the study aims to provide comprehensive insights into the current landscape and potential advancements related to IoT in TVET libraries.

5 Findings

5.1 Feasibility of integrating IoT technology in TVET libraries

The feasibility study findings of integrating IoT technology in TVET libraries reveal critical insights into the readiness of these educational institutions to adopt IoT solutions. The study by Mtebe and Raphael (2020) uncovers the existing technological infrastructure within TVET libraries, identifying strengths and weaknesses that may facilitate or hinder IoT integration. Additionally, assessing institutional policies and resource allocation towards technology adoption provides insights into organisational readiness.

Furthermore, Al-Hujran et al.'s (2015) findings reveal the perceptions and attitudes of stakeholders, including library staff, administrators, and students, towards IoT technology. Understanding stakeholders' perspectives is crucial in determining IoT integration's potential challenges and opportunities. Moreover, examining successful IoT implementations in similar educational contexts globally offers valuable lessons and best practices for Kenya's TVET libraries.

Ultimately, Nyangara and Ogenga's (2021) findings contribute to a comprehensive understanding of the feasibility of IoT integration in TVET libraries. The study provides actionable recommendations to support informed decision-making and strategic planning for IoT adoption in these educational settings by identifying technical, organisational, and human factors influencing feasibility.

5.2 Impact of IoT on TVET libraries

The findings aim to illuminate the multifaceted effects that IoT integration can have on various aspects of library operations and services by examining the impact of IoT on TVET libraries. Kim and Lee's (2019) study revealed improved resource management facilitated by IoT technologies, such as the real-time tracking of library materials and efficient inventory management systems. This enhanced resource management led to increased accessibility and availability of learning materials for students and educators.

Moreover, a study by Bawaneh and Ben Khadra (2020) uncovers enhancements in security measures within TVET libraries by implementing IoT-enabled surveillance systems and access controls. IoT technologies can create a conducive learning atmosphere for students and staff by providing a safer and more secure environment.

Nair and Anitha's (2020) study of IoT's impact reveals increased engagement and interactivity within TVET libraries. IoT-enabled devices and applications offer opportunities for innovative learning experiences and collaborative projects. By fostering a dynamic and interactive learning environment, IoT integration can contribute to the overall quality of education within TVET institutions. The study also continues to offer valuable insights into the transformative impact of IoT on TVET libraries, highlighting its potential to enhance resource management, security, and educational experiences for all stakeholders involved.

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5.3 Challenges and opportunities associated with IoT integration in TVET libraries

In uncovering the challenges and opportunities associated with IoT integration in TVET libraries, the findings offer insights into the complex landscape of implementing IoT technologies in educational settings. Ngulube and Onyancha's (2019) analysis shows the various technical challenges, such as infrastructure limitations, compatibility issues, and cybersecurity concerns, which may hinder the seamless integration of IoT solutions within TVET libraries. These challenges include insufficient funding for infrastructure upgrades and a lack of technical expertise among library staff.

Moreover, Gikunda and Nyakundi's (2020) findings identify organisational and administrative challenges, including resistance to change, bureaucratic hurdles, and inadequate policy frameworks, that impede the adoption and effective utilisation of IoT technologies. Examining stakeholders' perspectives also unveils opportunities for leveraging IoT to address existing educational needs, enhance learning experiences, and optimise library operations.

Furthermore, a study by Alqahtani and Alghamdi (2021) highlights the potential of IoT integration to foster innovation, collaboration, and digital literacy within TVET libraries, thereby preparing students for the demands of the modern workforce. The study identifies challenges and opportunities and provides actionable insights and recommendations to guide decision-making and strategic planning for successful IoT implementation in TVET libraries.

6 Conclusion

In conclusion, this study sheds light on the transformative potential of integrating the Internet of Things (IoT) in Technical and Vocational Education and Training (TVET) libraries in Kenya. Several key findings have emerged through exploring feasibility, examining impact, and identifying challenges and opportunities. Firstly, the feasibility of IoT integration in TVET libraries is influenced by existing technological infrastructure, organisational readiness, and stakeholder perceptions. IoT has demonstrated significant potential to enhance resource management, security measures, and learning experiences within TVET libraries. However, technical limitations, resistance to change, and cybersecurity concerns must be addressed to maximise the benefits of IoT integration.

In discussing these findings, the study aligns with the Diffusion of Innovations Theory, highlighting the varying adoption rates among TVET institutions influenced by factors such as perceived advantages and compatibility. Moreover, the Technology Acceptance Model is supported by the study's emphasis on stakeholders' perceptions of usefulness and ease of use in determining the acceptance and utilisation of IoT technologies within TVET libraries. Overall, the findings underscore the importance of strategic planning and targeted interventions to overcome challenges and harness the full potential of IoT in shaping the future of TVET education in Kenya.

7 Recommendations

The following are the recommendations of the study:

- **Investment in Technological Infrastructure**: TVET institutions in Kenya should prioritise upgrading technological infrastructure to support integrating IoT technologies in libraries. This includes ensuring reliable Internet connectivity, acquiring IoT-compatible devices and systems, and providing necessary training for staff to manage and maintain these technologies effectively.
- **Stakeholder Engagement and Training:** Engage all stakeholders, including library staff, administrators, students, and policymakers, in the IoT integration process. Provide comprehensive training and capacity-building programs to equip staff with the necessary skills and knowledge to

utilise IoT technologies effectively. Additionally, it fosters a culture of innovation and continuous learning to encourage acceptance and adoption of new technologies.

- **Addressing Security Concerns:** Develop robust cybersecurity measures to safeguard IoT-enabled systems and data within TVET libraries. This includes implementing encryption protocols, regular security audits, and awareness campaigns to educate users about potential risks and best practices for data protection.
- **Formulating Clear Policies and Guidelines**: Develop clear policies and guidelines governing the use of IoT technologies in TVET libraries. These policies should address data privacy, user access rights, and ethical considerations to ensure responsible and ethical use of IoT-enabled systems.
- **Collaboration and Knowledge Sharing**: Foster collaboration and knowledge-sharing networks among TVET institutions, industry partners, and government agencies to exchange best practices, lessons learned, and successful case studies in IoT integration. This collaborative approach can accelerate the adoption of IoT technologies and facilitate continuous improvement in library services and operations.

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30. Frameworks for Enhancing Access to Information Resources in Public Institutions in Uganda

Sylvia Namujuzi*; David Luyombya**

Makerere University

*snamujuzi@gmail.com; **david.luyombya@mak.ac.ug

Abstract

Since the beginning of time, information is a source of power. The more informed the population is, the better they become when making choices for improving welfare. Public institutions are one source of information. Through their legal mandates, public institutions in Uganda manage various records that contain credible information. Studies have confirmed that the country's public institutions are information-rich, as users minimally access the information materials. However, although the studies have reported the challenges faced and made recommendations in the closing chapters, a few have developed frameworks for bridging the reported gaps. As a result, the challenges reported by these studies have become recurrent problems, leading to information scarcity. Consequently, this has impeded the development of innovations. This paper provides an overview of information resources in public institutions in Uganda and the challenges facing access. It emphasises the lack of frameworks for enhancing access as an impediment to utilising information resources. To fill this gap, the paper discusses the scientific procedures that should be followed in developing frameworks for enhancing seamless access to information resources in public institutions. The paper ends with a conclusion and policy recommendations.

Keywords: *Public information access, open government, information rights, open data, Uganda*

1 Introduction

This paper focuses on access to information in the holding of public institutions in Uganda. Geographically, Uganda is one of the three countries that make up East Africa and politically, it is one of the eight countries that make up the East African Community (EAC). The other seven are Kenya, Tanzania, South Sudan, Somalia, Rwanda, Burundi and the Democratic Republic of Congo (DRC). The country is governed along decentralisation lines and has many public institutions. Collectively, they are referred to as Ministries, Departments and Agencies (MDAs). Like public institutions elsewhere, the MDAs in Uganda carry out a cornucopia of activities; over time, these have midwife records. Such records are referred to as information resources. The current and non-current information resources include policy manuals, workbooks, periodicals, datasets, ministerial reports, sector-specific performance reports, audio-visual materials, correspondences, sector-specific censuses, maps, and memorabilia, among others (Luyombya et al., 2023; Luyombya, 2010, 2012; Luyombya & Sennabulya, 2012; Magara, 2009; Namujuzi, 2022; Namujuzi & Luyombya, 2020; Okello-Obura, 2010). Some of these were appraised and became archives (Luyombya, 2012; Namujuzi, 2022). A large percentage of the information resources are kept in paper or manual form (Byamugisha et al., 2008; Luyombya, 2010; Namujuzi & Luyombya, 2020; Magara, 2009; Okello-Obura, 2010). As a result, these resources are not well managed or accessible. However, this situation is anticipated to improve, especially with increased emphasis on e-government (Nakakawa et al., 2021; Semwanga & Kahiigi, 2021).

Corollary to the above, Uganda has comprehensive legal records and information management frameworks. For instance, Article 41 of the Constitution of Uganda 1995 gives all citizens the right of access to information in the possession of the state unless the information is likely to interfere with state security or individual privacy (Lowry, 2013). In addition to this, in 2001, the Uganda National Records and Archives Act was enacted (Luyombya, 2010; Uganda, 2001). The Act requires public institutions' heads to create and maintain records of their functions and activities while following good recordkeeping practices (Luyombya, 2010). Besides, there is the Access to Information Act 2005 and Access to Information (ATI) Regulations 2011(Veit et al.,

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2013). Altogether, these laws mandate public institutions to ensure that information materials in their holding are fully accessed and utilised (Veit et al., 2013). However, despite this proclamation, results from a structured literature review have shown that access to information in public institutions in Uganda has continued to be problematic (Luyombya, 2010, 2012; Namujuzi & Luyombya, 2020), leading to scarcity of information for research and other uses. While this situation has prevailed for quite an extended period, there is hope for remedy through the development of frameworks. Frameworks support realising goals (Mugejjera & Nakakawa, 2023), such as enhancing user access (Namujuzi, 2022). Foundationally, frameworks are necessary for better access to information housed in public institutions. This need is even justified by the fact that much as some frameworks, such as the Agriculture Archives Management Framework (AAMF) (Namujuzi, 2022), have been designed to enhance access to information, they are context-specific and may not be usable or relevant in other contexts (Mugejjera & Nakakawa, 2023). Therefore, the purpose of this paper was to provide elaborate guidelines that should be followed by information scientists and scholars in packaging the strategies and recommendations emerging from their studies to come up with frameworks for enhancing user access.

2 Methodology

This paper co-opted the methodology applied by Namujuzi (2022) in her PhD study titled "Management of Agriculture Archives in National Agricultural Research Institutes in Uganda." This study developed an Agriculture Archives Management Framework (AAMF) and provides an in-depth analysis of the process and procedures that should followed when designing and evaluating frameworks for enhancing access to information materials kept by public institutions. The design science approach used is rooted in engineering and Information Systems. Given that Information Systems and Information Science are birds of a feather (McGonigle & Mastrian, 2012), Namujuzi explored studies in Information Systems that have developed frameworks for improving the performance of institutions in Uganda. Namujuzi's methodology was tailored to the methodology used by Information Systems scholars in Uganda (such as Ajidiru et al., 2021; Muzahuzi, 2022) to develop solutions for improving the performance of socio-technical systems of public institutions and make them responsive to the needs of stakeholders whom they are serving. More supporting views for enriching the methodology were extracted from the work of Abima et al. (2023) titled 'Service-Oriented Framework for Developing Interoperable e-Health Systems in a Low-Income Country'. The low-income country in question was Uganda. Apart from the above IS studies on Uganda, the secondary data from Namujuzi's study was supplemented by journal articles on developing frameworks using the Design Science Research (DSR) methodology. Casey and Wong (2020) and Tweedie et al. (2020) recommend using published and non-published documents to extract and analyse data to obtain concrete answers to pending research questions.

3 Results and discussion

Two sub-sections discuss the findings about the entire process of developing frameworks. The first section provides results on the processes followed, while the second covers the rules that should be observed while developing frameworks.

3.1 The process of developing frameworks

Frameworks are artefacts. They are developed using Design Science Research (DSR). According to Busse et al. (2021) and Akoka et al. (2023), DSR is a solution-seeking scientific approach initially used in engineering. Later, it was adopted by other disciplines, including Information Science. Studies following this approach produce real solutions for addressing real-life problems in a naturalistic or simulated setting (Romme & Meijer, 2020). DSR integrates prospective research (creative design) and retrospective research (scientific validation), as illustrated in Figure 1.
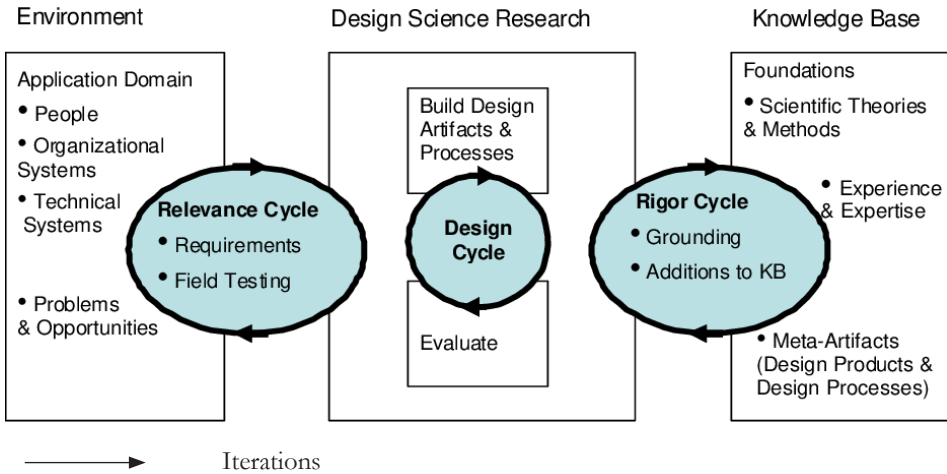
Figure 1: DSR processes
Adopted from Hevner and Chatterjee (2010)

Namujuzi (2022) established that most studies about access to information in public institutions in Uganda primarily concentrated on the first box titled 'Environment'. As such, these studies have identified and reported several challenges facing access to information in the holding of these institutions. By doing so, they have primarily engaged in what DSR calls requirements gathering. Despite some of these studies making a rigorous discovery of facts and grounding the findings in the established or existing theories, the input of the affected stakeholders about the efficacy of the recommended solutions has not been considered (Namujuzi, 2022). This tendency to provide researcher-based solutions without the active engagement of the users is referred to as a 'bystander problem' (Romme & Meijer, 2020). To enhance access to information in public institutions in Uganda and elsewhere, the existing limitations can be minimised by developing frameworks. This requires that the following processes or guidelines be followed:

3.1.1 Requirements gathering

This activity is performed in the 'Relevance Cycle' (see Figure 1). This cycle is a groundbreaking phase or curtain-raiser that enables a researcher or scholar to assess the environment in the study area. In this phase, the researchers and scholars can identify the gaps in the environment, which enables them to identify the requirements for developing the framework. The gaps are identified through collecting and analysing both primary and secondary data.

Primary data is collected using questionnaires, interviews, observation, focus group discussions (FGDs) and personal communication (Pers.Com). Given their big numbers, questionnaires are administered to the information users and seekers. The questionnaire data is supplemented by observations where the researcher uses their senses to establish any flaws that may not be reported in print or recorded. However, they are impeding access to and use of the information resources. Further, personal communication can also be used in this cycle and with this method, subject matter experts in Information Science from Information and Records Management Training Institutions such as EASLIS (Makerere University), Islamic University in Uganda (IUIU), Kabale University, Uganda Christian University (UCU) and Uganda Management Institute (UMI) can be targeted as a source of theoretical information.

Apart from questionnaires, observation and personal communication, more primary data can be generated through interviews. The interviews should target serving officers such as Librarians, Information Systems Officers, Archivists and Records Officers. The data from these individuals provides context-specific

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findings covering practitioner experiences about access challenges. Focus group discussions (FGDs) can also be administered to selected users and information management officers to gather broad data. The FGDs are vital because they enable one to develop triangulated ideas due to participant enrichment.

Research can also seek secondary data, which supplements and corroborates findings from primary data. Secondary data is mined from existing published sources such as journals and conference papers as well as non-published sources such as dissertations, internal institutional reports, newspapers, and grey literature (Bhangu et al., 2023; Sallis et al., 2021; Walliman, 2021; Watkins, 2022).

According to Hevner (2007), this stage enables researchers to assess the acceptance criteria and the limits within which they will evaluate the results obtained through gap analysis. By doing so, the researchers and scholars are now induced to draw a roadmap for scaffolding the framework. To design the best frameworks, Arnold and Wade (2017) recommend that researchers look back and forth to ensure that any weaknesses in the designed artefact are minimised. This process is called iteration. As long as researchers have not duly observed the prerequisites of this cycle, their solutions are likely to be questionable.

3.1.2 Designing the frameworks

After successfully gathering the requirements, a researcher should design a framework. The framework design takes place in the 'Design Cycle'. This cycle forms the backbone of the framework. Two major activities are performed in the cycle: designing and evaluating the artefact. The first sub-phase involves the actual design of the framework. While designing the framework, the researchers and scholars should iterate backwards and ensure the gaps identified during gap analysis are duly addressed (Hevner et al., 2004; Namujuzi, 2022). Furthermore, they should make a forward iteration to ensure that whatever solution they are providing is not a repetition of an existing artefact on the one hand and to ensure that the solution that is provided is grounded in the existing knowledge base on the other hand.

The second sub-phase involves evaluating the framework. According to Hevner (2007), the designed framework is conceived to be an objective solution. However, it is not mainly because the designer has used theoretical and experiential knowledge to develop the solution but has not engaged the real stakeholders affected by the problem the solution seeks to address. Therefore, in this line of argument, Wieringa (2014) surmises that the design cycle cannot be complete unless the framework is evaluated and new knowledge is produced and added to the knowledge base. At the evaluation stage, therefore, there are several iterations (see Table 1).

3.1.3 Grounding the framework in the existing knowledge base

Researchers are supposed to produce new knowledge. They do so by exploring the 'Rigor Cycle'. In this cycle, a researcher identifies related information to the problem the developed framework seeks to address. The purpose of engaging this cycle is to ensure that we are not reproducing knowledge but rather developing an innovation that is eventually added to the knowledge base (Hevner et al., 2004). Therefore, researchers should comb all the information sources using both backward and forward searches (Hevner, 2007). In this cycle, records and information management theories such as the Records Life Cycle, Continuum Model, Big Bucket Theory, Technology Adoption Model (TAM), Diffusion of Innovations (DOI) Theory and other theories borrowed from other disciplines such as Actor-Network Theory, Affordances Theory, Theory of Reasoned Action and many others are borrowed by the researcher to ground the findings obtained from Relevance Cycle. At this stage, a researcher plays a vital role in extending the existing theories and methods, creating new experiences and developing new artefacts and processes that are eventually added to the knowledge base (Arnold & Wade, 2017). Like in other cycles, iterations are also common in the rigour cycle (Table 1).

Table 1: Iterations involved in designing and evaluating a framework

Cycle	Iteration number	Iteration activity	Purpose of the iteration
Relevance	1	Gaps identification to inform design.	Design requirements developed from gaps.
Design	2	Flashback on the gaps.	To ensure that every gap identified has a solution.
	3	Forward searching of available literature, artefacts, meta-artefacts, experiential knowledge and theories.	To ground the framework in the knowledge base. To avoid reproducing an artefact.
	4	Flashback to the relevance cycle while evaluating the designed framework.	To confirm that every gap has been catered for.
	5	Forward searching of available literature and theories in rigour cycle.	To ground the evaluated artefact in the established conventions in the knowledge base.
	6	Flashback to the design sub-phase to ensure that critical parameters are selected for evaluation.	To ease the evaluation process and recommend an appealing and comprehensive artefact to the users.
	7	Designed and evaluated framework is added to the knowledge body.	This confirms that an innovation has been produced.
Rigour	8	Theories and literature, as well as existing artefacts informing the designing of the framework	To ensure that the established conventions guide the design.
	9	Theories and literature, as well as existing artefacts informing the evaluation of the framework	To ensure that the established conventions guide the design.

Adapted from Hevner et al. (2004), Hevner (2007)

3.2 Rules followed in designing and evaluating frameworks

Frameworks are designed and evaluated. Each activity has specific rules that are supposed to be duly observed, as discussed below.

3.2.1 Designing procedures

Designing a framework follows a protocol. During gap analysis in the "Environment", the researcher is supposed to tabulate the results in a matrix form (Table 3) (Mugejjera & Nakakawa, 2023; Namujuzi, 2022). The tabulated information identifies the design requirements extrapolated from the analysed data. When the design requirements have been identified, decisions must be made on what ought to be done to ensure that the design requirements are fully incorporated (Ajidiru et al., 2021; Mugejjera & Nakakawa, 2023; Namujuzi, 2022). At this stage, the framework under design should be grounded in the knowledge base. Therefore, the decision-making process should anchor on existing proven and tested knowledge that provides confirmatory evidence that the decisions are not based on hearsay (Abima et al., 2023; Namujuzi, 2022). For this reason, a researcher should cite scholarly sources supporting evidence that a design decision is critical in addressing an existing access challenge.

Table 2: Design requirements and associated design decisions

No.	Design Requirement	No.	Decision Made	Reference/Sources[β]
DR1	Gap 1	DM1	Decision 1	Author 1; Author 2
DR2	Gap 2	DM2	Decision 2	Author 3; Author 4; Author 5
DR3	Gap 3	DM1*	Decision 1	Author 2; Author 3; Author 6; Author 7

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DR= Design requirement; **DM**=Decision made; * A decision made on one of the design requirements can apply to other gaps; β A source can apply to more than one design decision

Once the designing phase is completed, a researcher should endeavour to provide succinct explanatory notes that will help to provide guiding information to the actual users of the framework because these have to refer to it time and again (Abima et al., 2023; Mugejjera & Nakakawa, 2023; Namujuzi, 2022). The explanatory notes should highlight and peg the roles and responsibilities into actionable do, which must be aligned with the designations of the concerned personnel (Namujuzi, 2022). The last important information that should accompany the framework is its salient characteristics or the features that make it outstanding. These should be mined from gap analysis and should be written in actionable language that further vindicates why the artefact is critical, novel and a solution provider to the long-standing problems in the study environment (Mugejjera & Nakakawa, 2023; Namujuzi, 2022).

3.2.2 Evaluation procedures

Evaluating the designed framework is a multi-pronged activity (Namujuzi, 2022). Efforts must be taken to ensure that the design principles are augmented by clearly stipulated evaluation procedures so that a complete and valuable artefact is produced. Based on this argument, Benfell (2021) conceded that in any case, when an artefact produced has not been evaluated, it remains subjective and may be of little or no relevance to the intended users or stakeholders. Thus, the evaluation of the framework should aim at ascertaining the extent to which it is usable, simple to follow, easy to understand, complete, has traceable linkages and flows, is applicable and efficacious, is useful and has a high degree of accuracy (Baskerville et al., 2018; Hevner, 2007; Hevner et al., 2004; Antunes et al., 2023). Amongst these parameters, depending on logistics and time resources available, the onus is on the researcher to decide whether they should evaluate the framework on some or all of the above parameters (Mugejjera & Nakakawa, 2023; Namujuzi, 2022). The rule of thumb is that to avoid complicating the evaluation exercise, only those parameters that are very critical should be selected. Romme and Dimov (2021) highlighted this matter and conceded that a few relevant parameters should be listed during the evaluation phase.

Besides selecting the evaluation parameters, they decide upon the environment used (Hevner et al., 2010). In real life, there are two environments from which a choice is made: artificial and natural. In artificial environments, simulations are used, while in the naturalistic environment, actual innovation users are engaged and involved. While simulations are cheaper, Venable (2006) recommends that interacting with the actual intended users in their locale or naturalistic environment is better since the framework is poised to provide a lasting solution to a recurrent problem.

The selection of the environment from where to evaluate the framework is followed by the selection of the methodology to be used. There are several evaluation methodologies (Hevner et al., 2004). These include: observation method, conducting experiments, test-oriented method, descriptive method and analytical method. Analytical evaluations are widely used compared to the rest (McLaren et al., 2011). The analytical method involves the use of an evaluation questionnaire. The questionnaire is administered to a purposively selected group of people with know-how and experience about the study environment (Muzahuzi, 2022; Namujuzi, 2022). In terms of structure, the questionnaire should begin with a preamble, followed by a drawing of the unevaluated framework (Namujuzi, 2022).

Including the drawn framework to be evaluated is introducing the selected participants to its configuration or structuring (Muzahuzi, 2022; Namujuzi, 2022). This eases the process of taking the evaluation respondents through the flow of activities, responsibilities and the viability of including the different parties and activities on the framework (Mugejjera & Nakakawa, 2023; Namujuzi, 2022). This process is referred to as structural walkthrough. It is necessary because the evaluation respondents must be acclimatised to the framework before responding to the statements in the evaluation questionnaire (Namujuzi, 2022). Also

called cognitive walkthroughs, Juliana (2023) conceives structural walkthroughs as mean techniques for ensuring that the intended users of the framework can learn and appreciate the efficacy of the innovation. After the cognitive walkthroughs, the purposive sample is requested to respond to the statements in the evaluation questionnaire on the selected parameters (Muzahuzi, 2022).

The last procedure is to immerse the intended users in the proposed solution or innovation by seeking their opinion about improving its efficacy. While the opinion is sought using open-ended question(s) at the end of the evaluation questionnaire, efforts can also be made to solicit additional information through casual or informal interviews.

4 Conclusion

Public institutions in Uganda are reservoirs of information for research and academic consumption. When this information is accessed, new knowledge would be produced. Consequently, the rate of innovation would be high, leading to improved quality of life and corresponding improvements in economic growth and development. Incidentally, users face difficulties utilising information resources in Uganda's public institutions. If this trend continues, Uganda will likely lag as the critical information needed for developing novel solutions will always be inaccessible and, therefore, not utilised. To correct this gap, this paper has provided insightful information to scholars in information science about the need to tailor their studies to developing solutions for enhancing access to information and how best they can do so.

5 Recommendation

The extensive analysis provided by this paper details the processes and procedures that are supposed to be followed by information science scholars to develop frameworks. This working knowledge has integrated critical practical and theoretical information that immensely supports scholars studying the challenges facing access to information in public institutions and corresponding efforts to develop solutions to minimise and mitigate the challenges. Armed with this knowledge, information science scholars and subject matter experts are therefore implored to return to the drawing board and hatch new ways and means of developing frameworks for improving access to information kept by public institutions. Apart from scholarly relevance, this paper also informs policymakers in higher institutions of learning that offer Information Science courses to integrate DSR as part of their curriculum so that students are equipped with knowledge about developing artefacts for improving the information and records management systems of both private and public institutions in Uganda. Specifically, the mandatory inclusion of a study objective focusing on developing an action-oriented solution as part of the research is desirable. This will not only meet unsatisfied public information needs but also reflect the value of money allocated to information management in public institutions in Uganda. Generally, when the current information scarcity is not addressed immediately, even efforts to adopt e-government will not produce the desired results.

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31. Care and Inclusion of Users with Special Needs in Kenya's Academic Libraries

Janet Njoora*; Thomas Oluoch**
St. Paul's University, Kenya
*jnjora@spu.ac.ke; **toluoch@spu.ac.ke

Abstract

Academic libraries support users in their research needs besides their pursuit of lifelong learning. As such, these libraries are expected to provide all users with a conducive and inclusive environment. Users with special needs require unique and convenient access to library services compared to the general populace, as the special needs could be medical, cognitive, psychological or physical. This research aimed to assess the level of care and inclusion of users with special needs in academic libraries in Kenya. The study's objectives were to assess the accessibility of library services to users with special needs, evaluate the challenges librarians experience when serving users with special needs, and examine measures put in place to ensure inclusion of users with special needs in the provision of library services. This study was carried out using a systematic literature review from secondary sources of information in different electronic databases. The study found that there is a need to have inclusive and accessible services for all users in academic libraries in Kenya. In addition, since librarians face some challenges as they serve users with special needs, several measures need to be taken to enhance inclusive service provision. The study also recommended enhanced collaboration between service providers and librarians to ensure the availability of resources adapted for users with special needs, designating specifically trained librarians to serve users with special needs, and mobilising adequate funds to create inclusive library spaces, among other strategies.

Keywords: *Accessibility, adaptive technology, assistive technology, persons with disability, availability*

1 Introduction

Information is an invaluable asset to people across the world, and libraries should aspire to have an inclusive environment where information is accessible to all users irrespective of race, age, religion or even special needs, as all people have a right to access information as it provides them with knowledge and supports decision making. The concept of inclusivity ensures that users feel welcome, valued, and respected in the library, and this helps create an environment where everyone is considered in providing library services and resources, leading to a more inclusive society. Academic libraries should create an inclusive environment to accommodate users with special needs. The Convention on the Rights of Persons with Disabilities and its Optional Protocol CRPD (2006) defines persons with special needs to "include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others". IFLA (2022), in the Marrakesh Monitoring Report, explains that libraries should be at the heart of providing support and services tailored to the needs of users with special needs. Therefore, libraries are encouraged to develop policies that enable information sharing in accessible formats to avoid discriminating against such users.

Libraries are dynamic institutions expected to adapt to changing user needs in all spheres by providing inclusive and accessible services to promote an empowered society. Disability studies have indicated that a sense of inclusion is essential for users with special needs to allow them to achieve positive self-worth and social skills and find their place in the community. A study conducted in Tanzania by Majinge and Msonge (2020) indicated that despite policies on recognising people with special needs, minimal initiative is taken to support the group, even in libraries. Kenya may not be an exemption. These users are not served adequately since few librarians understand their information needs.

According to Owino (2020), the Kenya Population and Housing Census Report indicated that 2.2 (0.9% million people) of Kenyans have some form of special needs. Kenyan laws guide barrier-free access to facilities

and services to support this group. According to the Commission for University Education 2018 report (CUE, 2018), 881 students with special needs (hearing, visual and mental impairment) were enrolled in Kenya Universities in 2016 and 793 in 2017. As a result, academic libraries in Kenya exist to establish, promote, and sustain quality services that facilitate teaching, learning, and research. They have a role to play in meeting the needs of these users who require specialised attention in information provision. A study by Shikuku (2022) on the level of preparedness in Kenyan academic libraries to serve users with special needs established that these libraries were inadequately prepared since they lacked appropriate facilities for users with special needs. In addition, the study also found that most librarians did not have the requisite skills to serve these users, especially those with hearing impairment. Although this may be true in many academic libraries, there are also success stories. For example, the Kenyatta University Library has endeavoured to create an inclusive environment by providing resources and services that cater to users with special needs (Gichuhi et al., 2021).

2 Methodology

This paper adopted a systematic literature review (SLR) methodology. This academic method helps identify and evaluate relevant literature on a topic, resulting in a conclusion for the question under study. This method is helpful in research when there is a need to provide an overview of a particular issue or research problem and evaluate the state of knowledge in a particular topic (Synder, 2019). A systematic literature review was carried out in electronic databases, helping the authors demonstrate the current state of research on the topic and identify gaps and areas for further research regarding the research objectives. This method involved a review of existing literature, and the researchers undertook the following steps.

- **Defining the issue to explore** – The researchers defined the topic as 'Care and Inclusion of Users with Special Needs in Academic Libraries'.
- **Developing a protocol (procedure)** – A detailed plan outlining how the review process would be conducted was developed. The justification for conducting the review and the questions/objectives was clarified.
- **Search for relevant studies** – The researchers conducted a wide-ranging search enabled the researchers to identify all relevant research articles.
- **Selection criteria** – The researchers evaluated the quality and relevance of each study based on the keywords criteria, relevance, and currency. Keywords identified included accessibility, library services, librarians, and adaptive technology.
- **Extracting data** – The researchers collected the relevant information from selected studies.
- **Synthesise the data** – The researchers gathered and examined the findings from different retrieved studies.
- **Writing the report** – This involved presenting the findings in a well-arranged set-up as given in this study.
- **Databases used** – Emerald, Sage, Research Gate, Reports (GOK and IFLA), conference proceedings (SCECSAL and KLISC), institutional repositories (KU and UON).

3 Findings

The findings are discussed below following the researchers' systematic literature review.

3.1 Accessibility of library services to users with special needs

The availability and accessibility of information resources in academic libraries are necessities that cannot be overlooked since they provide information literacy and resources to students, researchers, and other university staff. These information resources may be available in the library, but users with special needs

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may never access them if specialised facilities are not provided. Libraries should take suitable measures to ensure inclusive accessibility of the resources provided by providing suitable technology and considering the psychological well-being of users with special needs.

Libraries' perspectives on users with special needs and inclusive accessibility to information services have continued to evolve. Longmeier and Foster (2022) explain that universities have to comply with different laws regarding special needs and the provision of information. As a result, libraries have adjusted digital products, spaces, and services to better serve users with special needs. Librarians need to understand the situations they can control or have the capacity to change and situations where they can advocate for change through a consortium or vendors who can provide inclusive products and services that meet users' needs. For example, a library's website must be accessible since it serves as the library's virtual front door, and its inaccessibility negatively impacts the accessibility and use of electronic resources.

In this digital era, most libraries provide online resources to their users. Frank (2023) noted that many libraries have an accessibility webpage (disability services) designed for users with special needs. This webpage is meant to provide information on areas such as physical accessibility of the library building, reference guides, and accessibility of the information resources to increase their usability. A well-done accessibility webpage allows the library to connect with users with special needs without the users providing their disability status. However, different studies have discovered that some libraries offer limited or incomplete information on these pages, hindering adequate access to information. Academic libraries in Kenya should aspire to provide inclusive online services, relevant information in suitable formats, have adequately trained personnel and appropriate technologies to enable access, retrieval and use of information (Kiruki & Mutula, 2021)

A study carried out among students with special needs at the University of Georgia by Roberson et al. (2022) indicated that most of the students with special needs use screen reading software to read the digital text while others need large font size or the digital format of the book since they cannot carry the weight of print books. In addition, the library has librarians designated to provide in-person and remote reference and research to these users on request. These librarians, referred to as Libraries' Disability Services Coordinators, assist users in retrieving materials, conducting library research and addressing other needs, such as scanning documents for users who may need to create accessible versions of library materials. In addition, the librarians liaise with faculty to make course materials available, which are checked for accessibility and compliance with copyright. Having a librarian(s) specifically assigned to serve users with special needs in Kenyan academic libraries would make a big difference in enhancing inclusivity and helping these users feel appreciated.

To enhance inclusive accessibility to information resources and services, academic libraries must evolve and change their spaces to meet technology-driven user needs. This, therefore, requires library spaces such as stairs, lifts, special rooms, parking, entrance and shelves to be accessible to users with special needs. In Kenya, students with special needs enrol in different institutions, and difficulty accessing the library denies them the resources and services offered. To ensure inclusive service delivery, libraries should restructure their spaces and promote architectural designs that accommodate these users. They should also provide wheelchair turnarounds, talking books, newspapers, and periodicals (Gikunju et al., 2023).

3.2 Challenges librarians experience when serving users with special needs

The results of a study by Wijayaratne and Amarasekara (2015) among Sri Lankan library professionals revealed that the librarians are not adequately knowledgeable and sufficiently skilled to operate an inclusive service for people with special needs. However, they are incredibly willing to do so. In addition, promoting inclusivity is not easy, and librarians face several challenges when serving users with special needs. These challenges include limited availability of library services and resources specifically designed for users with

special needs, lack of suitable formats for accessing library materials, insufficient Internet accessibility and inadequate instruction on accessing the library. Academic librarians face challenges in providing accessible materials, particularly in their relationships with publishers and special needs services offices.

The relationship between the publishers and librarians tends to be a significant factor that impacts inclusive access to resources by users with special needs. Some publishers tend not to care about accessibility and, therefore, overcharge for the resources, which makes them relatively unaffordable to libraries (Day & Fleischmann, 2020). Other issues, such as Digital Rights Management (DRM), which guides the use of technology to control and manage access to copyrighted material, make it quite challenging for the librarian to serve users with special needs. DRM significantly hinders acquiring accessible content by inherently making resources more difficult to modify and manipulate. Rossiter (2016) explored how academic libraries and publishers can collaborate more effectively to deliver on their shared core mission of fostering access to knowledge across disciplines. She found out that a good relationship would greatly help enhance the inclusive provision of services to users with special needs in academic libraries across the globe.

Librarians are expected to create an inclusive environment for users with special needs in many university libraries. However, this becomes challenging due to budgetary constraints and special problems that academic libraries experience (Wijayaratne & Amarasekara, 2015). More so, academic libraries face difficulties such as the provision of shelves accessible to users in wheelchairs, space to shelve special resources such as the Braille books, which need considerable capacity of space than shelving of monographs in general format, lifts/ramps to facilitate access to upper floors among others. Although there are laws governing the construction of public buildings to ensure inclusivity, users with special needs, in some cases, face challenges in accessing library spaces, suggesting that they do not benefit fully from the services and facilities. This implies that the librarians do not serve them satisfactorily owing to the unavailability of special areas for this special category of users. According to Ilako et al. (2020), studies conducted back in the 1980s indicated that students with special needs access to library buildings is not limited by the individual inability but rather by the inadequate facilities, such as walk paths and ramps that do not favour the users with special needs. All these add to the librarians' challenges when providing inclusive services to this special category of users.

Since libraries are vital information centres serving diverse categories of user communities, they should have dedicated personnel with knowledge of inclusivity who can offer practical assistance, providing specialised services to almost every member of the user community (Nazim & Sarkar, 2021). These may include special reading services at the scheduled library time. However, this is not the case in most institutions since librarians are not well endowed with the skills to adequately serve users with special needs. Nazim and Sarkar (2021) suggested that technology can help support such users through the provision of such services as the Digital Talking Books program, which can be adopted in some instances to enhance access to the contents of the resources. However, some challenges are also experienced in most libraries regarding cuts in budget affecting technology availability. Despite the rollout of the digital service, there are ongoing concerns that the care and inclusion of the users are not comprehensive enough to meet their demands.

3.3 Measures put in place to ensure the inclusion of users with special needs in the provision of library services

Different studies have been carried out on measures that can be taken to enhance inclusive service provision to library users. According to Bodaghi et al. (2017), librarianship is a service-based profession due to its contact with humankind and the values, knowledge and skills it passes on to the users. Due to this reason, awareness needs to be created on having an inclusive environment to cater for users with a disability and, more so, those with 'invisible disabilities' who may face barriers that are not obvious to the librarians. The librarians should also improve their communication skills to handle these users, as these skills allow them to provide a supportive system, a welcoming culture and an atmosphere of acceptance among these users.

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In a study carried out in Denver, McGowan et al. (2018) noted that the majority of the people with disability who visited the library were living with cognitive or intellectual disability or a combination of disabilities. In addition, these users generally felt isolated from their communities as they experienced poor health. Due to this challenge, the library developed an inclusive programme to help these users feel appreciated and engaged. This programme aimed to change the staff's perception to help them feel more comfortable engaging with this category of users and create an opportunity for them to understand and fulfil their goals as professionals. In addition, librarians need to enhance collaboration with organisations dealing with people who live with disabilities to acquire skills on how to interact and best serve these users.

People living without disabilities should fully accept those with special needs by removing the subtle barriers inherent in their attitudes, and librarians should not be left behind. This can be achieved through training and having honest conversations among librarians about their expectations when serving this population. For example, librarians may be encouraged to greet and acknowledge these users and assist with serving their information needs. Ultimately, this reduces hesitation, the fear of doing or saying the wrong thing, and even self-judgment about previous attitudes. To achieve a positive attitude towards users with special needs, McGowan et al. (2018) suggested the following activities: treating all users as capable and competent irrespective of their dependency on others for essential functions, inviting the people living with special needs to fully utilise library services, empowering users with special needs to coordinate some library activities and suggest library materials to be acquired, empowering staff and providing them with resources to communicate with these users effectively and by proving a model of a truly inclusive community which can be replicated in other libraries.

The librarians need to be more intentional and flexible in designing library spaces that are more inclusive and accessible to users with special needs. This may vary from changing language on signage, having an open floor model which allows comfortable use of wheelchairs, and having large, easy-to-read signage and welcoming spaces that allow collaboration, studying and quiet reflection, among others. Gikunju et al. (2023) explained that although some academic libraries in Kenya had already taken measures to accommodate people with special needs, more must be done to add facilities for serving users with special needs. Some of these measures include having designated computer workstations adapted for users with special needs, providing talking books, newspapers and periodicals, having designated computers equipped with screen reading programs, enlargement and synthetic speech, providing lifts for people with walking disabilities, having short shelves that are easy to access, providing adjustable desks and training librarians to serve persons with special needs.

The use of assistive and adaptive technologies in academic libraries is paramount, making the services and resources inclusive and accessible to people with special needs. Assistive and adaptive technologies (AT) refer to aids (soft and hardware) that assist users in accessing or adapting a library resource so that it becomes usable to people with special needs. These technologies promote independence by enabling users to carry out activities by themselves, which they had to depend on someone previously for assistance by providing enhancements to or changing the methods of interacting and accomplishing the tasks (Kiana et al., n.d.). Assistive technology promotes inclusivity and facilitates the provision of library services easily, independently and in formats suitable for their use. The assistive devices may include Braille machines, computers, large optical/non-optical print materials, Braille books, talking calculators, hearing aids, magnifying glasses and audio recorders.

Academic libraries use websites to provide the resources and services to ensure access and utilisation of information resources. Therefore, librarians should ensure that people with special needs have access to the websites to reduce their social exclusion since they have information needs just like the other users. This could be done by integrating assistive technologies to create awareness of available resources besides providing online information services (Kiruki & Mutula, 2021). The checklist prepared by the IFLA Standing Committee of Libraries Serving Disadvantaged Persons (LSDP) expounds on the requirements for accessibility to library

websites and catalogues to allow users with special needs to locate, retrieve and use information (Irvall et al., 2005). The libraries should, therefore, ensure that they eliminate the barriers associated with ICT, including lack of assistive technology and devices due to poorly designed websites. These guidelines provided by IFLA liberate people with special needs since they can access the websites and use the resources.

4 Discussion of findings

From the study, it is clear that libraries should strive to provide inclusive accessibility and use of library resources to all users. As explained by Longmeier and Foster (2022), libraries should comply with the necessary legal requirements to cater for all users, even those with special needs. This may further call for the librarians to work together with service providers to ensure that the available resources, especially those in electronic format, are made accessible to this category of users. The libraries should also be designed to accommodate users with special needs as guided by the IFLA Standing Committee of Libraries Serving Disadvantaged Persons (LSDP) (Irvall et al., 2005).

Although academic libraries strive to provide an inclusive environment for all users, some challenges may hinder the adequate provision of services. One of the significant challenges experienced is the lack of trained librarians to handle users with special needs, as discussed (Wijayaratne & Amarasekara, 2015). This may call for a review of the librarians' training curriculum to ensure that the trainees are all-rounded and have the requisite technological skills to help provide adaptive technologies. The availability of resources in a format that allows inclusive accessibility is another challenge. The librarians must work with publishers to agree on an affordable package catering to all users.

To ensure that inclusivity is achieved in academic libraries, the measures should have strategies that can be implemented. For instance, a library may have a programme where it works with organisations that handle people with special needs. This ensures that librarians understand these users and are trained to serve them and create an accommodative environment, as suggested by (McGowan et al., 2018). In addition, academic libraries need to invest in adaptive technologies which make it easier for users with special needs to access library resources and services.

This research study found that academic libraries strive to create an inclusive environment for all users, but more must be done. Librarians need to advocate for a higher budgetary allocation from the universities to enable them to provide inclusive services. They should also collaborate with service providers, publishers, and even organisations that handle users with special needs to ensure success.

5 Conclusions

According to the study, creating an inclusive environment in academic libraries in Kenya is vital since it allows users to feel appreciated and respected. It also allows the users to conveniently access the available resources and services to meet their information needs. However, challenges abound among librarians, which hinder the inclusive provision of services to users with special needs. These challenges may result from inadequate funds, lack of skills, negative attitudes among librarians when serving users with special needs, and inadequate library spaces deter movement and access to resources among academic libraries. It is, therefore, important for librarians serving in academic libraries to put measures in place to serve the users better and reduce the exclusion of users with special needs. These measures may include collaboration with organisations serving people with special needs, having librarians who handle these users and who have undergone training on interacting with them, redesigning the library spaces to have a more inclusive environment and using technology to enhance access to services by users with special needs.

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6 Recommendations

From the study, it is clear that academic libraries in Kenya need to improve their service provision to users with special needs and create a more inclusive environment where users feel appreciated and respected even as they interact in society. The study, therefore, makes the following recommendations;

- Enhanced collaboration between service providers and librarians to ensure the availability of resources adapted for users with special needs.
- Having librarians specifically designated to serve users with special needs who have undergone training to enhance their communication skills.
- Adequate funding is needed to create inclusive library spaces that cater to this category of users without hindrances.
- Formulation of library policies which advocate for the provision of inclusive library services.
- More collaboration between faculty and librarians should ensure that course materials are available in the libraries in formats helpful to people with special needs.
- Having programmes/activities where users with special needs participate helps them feel like they are part of the larger user community.

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32. The Role of Academic Libraries in Supporting Research and Postgraduate Services in Kenyan Universities

Wamahiga M. George

Karatina University

mwangiwamahiga2@gmail.com

Abstract

This paper reviewed the role of academic libraries in supporting research and postgraduate services in Kenyan universities while focusing on challenges and opportunities. This review aims to inform policymakers, university management, government and university librarians on the most effective way of improving library services to postgraduate students and researchers. The study examined Scopus, Web of Science, Science Direct, JSTOR, Semantic Scholar, Research Gate, Academia and Google Scholar databases to identify articles published on the topic and presented the findings thematically. The assessment identified 84 publications, of which 36 addressed the relevant topic. The findings indicated that university libraries in Kenya provide access to a wide range of scholarly resources, including books, journals, databases, research materials, and digital resources such as e-journals and e-books. However, some university libraries do not have subscriptions to expensive journals or publishers (Elsevier, Taylor & Francis and Springer, among others). Also, many Universities' academic libraries have other challenges, including limited funding, insufficient infrastructure, a shortage of qualified staff to keep up with evolving technologies, technical expertise and low levels of information literacy among students. Libraries can explore opportunities for interlibrary cooperation, fundraising, resource sharing and consortiums to expand the breadth and depth of available materials. The universities should also prioritise increased funding for academic libraries. In addition, funding should be used to acquire up-to-date research materials, invest in modern technology infrastructure, and provide staff training.

Keywords: *Universities, library resources, postgraduate students, support*

1 Introduction

Since ancient times, libraries have been integral to our society and trace their roots to institutions like the Library of Ashurbanipal, one of the world's oldest libraries (Stauffer, 2021; Ari, 2017; Aljbori, 2018). Established in Nineveh by the Neo-Assyrian King Ashurbanipal (7th century BCE) with over 30,000 texts, it aimed to preserve Mesopotamia's history and culture (Na'aman, 2006; Miller, 2022). Libraries play a significant role in contemporary society and are widely considered as the community's "Gateway to knowledge" (Ari, 2017). Globally, they serve as dynamic centres for education, information dissemination, and community engagement (Chua & Goh, 2010; Ntlotlang & Grand, 2016). Moreover, they preserve cultural heritage, ensuring that historical and contemporary knowledge remains accessible to present and future generations (Roy et al., 2011; McDonough et al., 2017; Stephens, 2016). In an era of rapid technological advancements, libraries continue to evolve, embracing digital technologies and adapting their services to meet the changing needs of the global community (Jayadatta & Kammar, 2023; Makori & Mauti, 2016). Libraries are crucial in developing a country, providing individuals and communities access to information, education, and knowledge (Mchombu & Cadbury, 2006).

Kenyan universities contribute to national development by providing research and expertise to solve social problems (Sindabi, 2017; Bailey et al., 2011). They also partner with the government and other stakeholders to conduct research that informs policy-making, develop innovative solutions and technologies that boost economic growth and produce highly skilled graduates who can contribute to various economic sectors (Osano, 2017; Chepkorir, 2022). Many Kenyan libraries are found at colleges and universities (Otike &

Barát, 2021; Otike & Omboi, 2010; Ojiambo & Kasalu, 2015). Otike (2004) asserts that the development of University Libraries in Kenya can be traced to the colonial era. However, it was not well marked as that of special and public libraries, mainly because there were very few academic institutions at that time. They have been instrumental in contributing towards the attainment of the Sustainable Development Goals (SDGs) and Kenya Vision 2030 (Kamau & Owano, 2018; Gichohi, 2016; Kalugho, 2018) as they provide access to a wealth of scholarly resources and supporting the information needs of researchers, staff and postgraduate students in their thesis and dissertation writing (Makori, 2015).

Despite the significant role academic libraries play in research support and postgraduate services, several challenges hinder their effectiveness in Kenyan universities. These challenges limit the capacity of academic libraries to effectively fulfil their role and hinder the advancement of research and the success of postgraduate students. This review aims to examine these challenges in detail and explore opportunities for addressing them, ensuring that academic libraries can provide efficient and comprehensive support to research and postgraduate services in Kenyan universities.

2 Methodology

The study focused on both public and private universities in Kenya. A comprehensive review of published literature was performed using Web of Science, JSTOR, Semantic Scholar, ResearchGate, Academia and Google Scholar. The keywords used included "academic libraries," "research support," "postgraduate services," "Kenyan universities," "challenges," and "opportunities". Keywords were typed in using the search engines, and the time-frame filter was set between 2003 and 2023. By conducting data cleaning, duplicates were eradicated, resulting in a retrieval of 84 articles; however, 48 were excluded for these main reasons: specific articles discussed university libraries in Kenya without direct relevance to their roles and challenges, some articles had overly broad scopes, often about the entire African continent, Sub-Saharan Africa, or other East African countries excluding Kenya; lastly, some articles addressed developed nations like Canada and Europe with only vague references to Kenya. Consequently, 36 publications adhering to the inclusion criteria were identified, and their content was categorised into three themes: roles, challenges, and opportunities, based on a review of either their abstracts or the entire article.

3 Results and discussion

3.1 Role of academic libraries in supporting research and postgraduate services in Kenyan Universities

University libraries in Kenya contribute to research support by offering various services and resources that facilitate the research process. These services include access to diverse scholarly materials, such as books, journals, databases, and other digital resources. Several researchers have explored the different ways in which academic libraries contribute to research support. For example, a study conducted by Okongo (2014) examined access and utilisation of digital information services in academic libraries at the University of Nairobi. It highlighted the importance of reliable Internet connectivity in enhancing research activities. Moreover, academic libraries in Kenya serve as repositories of valuable research outputs, preserving and disseminating scholarly work for future generations. Rugut (2015) focused on adopting open access initiatives in disseminating scholarly research by academic staff at selected universities in Kenya and found that libraries play a crucial role in facilitating the dissemination of research output though open access. However, open-access publishing was low, and the study recommends institutionalising open-access publishing in Universities in Kenya and training on open-access issues to improve access and dissemination of scholarly research. On the other hand, Mwiti (2017) studied the factors influencing access repositories at Kenya Methodist University and reported that the KeMU repository should be vibrant in enabling open access to scholarly work.

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In addition, university libraries also assist in information literacy skills, helping researchers navigate the complex landscape of academic resources and stay up-to-date with the latest research trends. Otike and Omboi (2010) highlighted that the primary responsibility of libraries is to assist their users (staff and students) in transforming information into knowledge. The librarian in the university coordinates the evaluation and selection of information resources required for the various programs and organises and maintains the collection of these resources. Equally important is the responsibility of providing information literacy skills. Some university libraries organise workshops and training sessions to enhance researchers' information literacy skills. Fombad and Sirorei's (2019) study focused on knowledge management processes at St Paul's University Library in Kenya. The study found that libraries offer training sessions and workshops on information literacy skills, research skills, and academic writing, which are invaluable in supporting staff and students.

University libraries offer extensive support to postgraduate students during the thesis and dissertation writing process. They provide access to relevant research materials and assist students in locating appropriate sources. Librarians also offer guidance on literature review techniques, citation styles, and information organisation. Wachira et al. (2020) research investigated the influence of librarians' assistance on the success of the doctoral research process in specific Kenyan public universities. Their findings indicated a robust and favourable correlation between librarian support and the success of the doctoral research process. Notably, an increase in librarian support was associated with a substantial 43.4% increase in success rates for the doctoral research process.

Several university libraries provide digital tools and resources to support postgraduate research. This includes access to research databases, citation management tools, and statistical software. Also, they provide online repositories where postgraduate students can access and contribute to research outputs, including theses and dissertations. These repositories enhance the visibility and accessibility of scholarly work. The study by Masese (2016) examined solutions to improve the availability and utilisation of electronic resources among postgraduate students at specific university libraries in Kisii County, Kenya. It has been reported that libraries offer electronic resources to postgraduate students at a distance, support research and innovation, and supply additional digital copies wherever feasible. Increased access to technology has altered how students study, while the variety of electronic information resources has widened the potential resource base for all students. These developments have reduced face-to-face teaching and the need to visit the library building for help. It also means librarians must alter how they plan and deliver IL instruction. In their 2021 study on the role of academic libraries in supporting research and postgraduate services in Kenyan universities, Merande, Mwai, and Ogalo emphasised the significance of electronic resources. The research revealed that postgraduate users extensively utilise electronic resources in selected Kenyan academic libraries, underscoring their importance in enhancing student performance and contributing to the universities' objectives. Otike and Barát (2021) studied the roles and emerging trends of academic libraries in Kenya, which established that change is inevitable and that academic libraries are supposed to adapt to the emerging trends and roles, lest their function and service become redundant. Because library users' information needs and information-seeking behaviour are changing, academic libraries should devise new and innovative ways of reaching out to their clients.

3.2 Challenges facing academic libraries in supporting research and postgraduate services in Kenyan universities

University libraries in Kenya face several challenges that hinder their ability to support research and postgraduate services effectively. Limited funding is a major challenge faced by academic libraries in Kenya. The inadequate financial resources allocated to libraries often result in a lack of necessary materials, limited access to online databases and journals, and outdated or insufficient technology. Due to these limitations, libraries struggle to acquire relevant and up-to-date resources, hindering the research and postgraduate

services they can provide. It is crucial for increased investment in academic libraries to ensure they have the financial means to adequately support research and cater to the needs of postgraduate students and scholars. Weng'ua et al. (2019), Otike and Omboi (2010), Kamau and Elegwa (2022) leading to limited resources for acquiring new books, journals, and electronic databases and also affecting the maintenance and upgrade of library infrastructure and technology. Similarly, university library budgets keep fluctuating from year to year. Weng'ua et al. (2019) highlighted that the Commission for University Education in 2018 stated that all universities in Kenya, both private and public, ought to spend at least 10% of their total institutional budgets on information resources to support the ongoing and appropriate needs of the library. However, most institutions of higher learning in Kenya have yet to adhere to this regulation. In examining challenges and interventions in implementing strategic plans within chosen public university libraries in Kenya, Harrison et al. (2022) observed a significant impact on the execution of strategic plans due to insufficient financial resources. The research suggests that management should contemplate assigning sufficient funds to address this issue. Another study done in four public university libraries from the western region of Kenya by Nyakweba et al. (2022) on users' needs and expectations of information services provided in libraries noted the poor state of affairs with inadequate financial allocation. The study recommended an additional library budget to facilitate the acquisition of additional and up-to-date information resources and facilities. Odongo's (2011) study focused on assessing ICT adoption in the University of Nairobi Libraries. It highlighted that inadequate funding was one of the major challenges they faced in service delivery. Otike and Omboi (2010) noted that unlike public universities, which heavily rely on government funds, private universities never receive funds from the government; they rely on their funds, well-wishers and donations. Furthermore, they are subjected to heavy scrutiny by the Commission for Higher Education before being granted a university charter document. As a result, most private universities are well-equipped with better facilities, infrastructure, personnel and programs.

Insufficient infrastructure is another challenge that academic libraries in Kenya face. Many libraries lack the facilities and technological infrastructure for effective research support and postgraduate services. Inadequate physical space, outdated library systems, and limited access to computers and Internet connectivity hinder the ability of libraries to provide a conducive environment for research and learning, as attested by (Ringeera (2007), UNESCO (2018), Weng'ua et al. (2019), Okwakol (2008), Maina and Muthee (2020), Tarus et al. (2022). These infrastructure limitations restrict the potential of academic libraries to support research activities and fully enhance postgraduate services. The results also agree with those of Gudo et al. (2011), who observed that lack of relevant books, inadequate use of the Internet and general lack of reading space created the major constraints to student reading.

Staffing issues pose a significant challenge to academic libraries in Kenya. Many libraries have a shortage of qualified and experienced librarians and support staff. This scarcity of skilled professionals limits the ability of libraries to offer specialised research assistance, provide guidance to postgraduate students, and efficiently manage library resources. Staffing issues also increase workloads for existing personnel, impacting the overall quality and availability of research and postgraduate services. Adequate recruitment and professional development initiatives are vital to address staffing challenges and ensure the effective functioning of academic libraries in Kenya. Maina and Muthee (2020) conducted a study on the readiness of academic libraries in Kenya to adopt cloud computing technologies. Their findings indicated that a significant challenge in the adoption process was the inadequacy of staff skills required to utilise cloud computing effectively. This deficiency in skills posed a considerable obstacle in providing the full range of services expected by library patrons. In contrast, Mauti et al. (2018) assessed the accessibility and utilisation of by postgraduate students at the Adventist University of Africa Library in Kenya. Their study revealed that a notable challenge was the absence of guidance provided by library staff to the students. This lack of assistance from the library staff emerged as a hindrance to effective access and use of information resources by postgraduate students at the institution. Mugo and Mathu (2021) also identified that a lack of trained

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personnel is a major factor that impedes effective ICT adoption in Kenya's university libraries. Ogenga's (2015) research on adopting institutional repositories in Kenyan universities, focusing on the United States International University Africa, highlighted a substantial challenge related to staffing issues. The study found that the library staff lacked essential skills for efficient repository management. Consequently, the recommendation from the study emphasises that library management should arrange training sessions for staff to enhance their proficiency in managing the repository effectively.

Copyright and licensing are other challenges facing university libraries in Kenya regarding providing access to research materials. The complexities of copyright laws and licensing agreements often restrict the libraries' ability to offer their users a wide range of resources. Limited access to copyrighted materials, such as scholarly journals, hinders the research process and limits postgraduate students' access to critical information. Libraries must navigate these legal and contractual challenges by establishing effective policies, seeking permission for necessary materials, and advocating for more flexible and affordable licensing models to ensure seamless access to research resources. Otike's (2020) study delved into the legal aspects of delivering information to support distance learning through digital libraries in Kenyan universities, revealing challenges associated with copyright and licensing. The investigation highlighted the risk of copyright infringement, emphasising the absence of sufficient exceptions and limitations to copyright restrictions, which could cause university authorities and librarians to face infringement charges.

Makori (2009) highlighted that Kenyan university libraries face significant challenges in providing information, losing their traditional dominance due to changes in the information environment, media landscape, technological innovations, user expectations, and economic issues. Rapid advancements in information technology constantly reshape research and learning, requiring libraries to adapt and integrate new technologies to support research and postgraduate services effectively. However, the limited resources, technical expertise, and infrastructure pose obstacles to adopting and incorporating these advancements, as stated by Burudi, Wasike and Ndegwa (2021), Nche (2022), Kasella (2020), Murithi, Gichohi and Irura (2020), Tarus et al. (2022), Gitonga et al. (2023), Guto and Wasike (2022), Merande et al. (2021) and Wangari (2021).

Another significant challenge confronting academic libraries in supporting research and postgraduate services in Kenyan universities is the insufficient library and information skills or low levels of information literacy among students, as indicated by Mwatela (2013) and Manyissa (2014). Additionally, Mauti et al. (2018) emphasised study evaluating the access and use of information resources by postgraduate students at the Adventist University of Africa Library in Kenya that major challenges include a lack of adequate information technology skills, language barriers hindering access to library resources, and a lack of awareness and guidance from library staff.

3.3 Opportunities for universities academic libraries in Kenya

Ngetich e al. (2016) explored fundraising as a funding source for public university libraries in Kenya and revealed that public university libraries in Kenya carry out fundraising activities as a source of supplementary funding. Collaboration with research institutions is a crucial opportunity for academic libraries in Kenya. By forming partnerships with these institutions, libraries can access numerous research materials and resources, including scholarly journals, databases, and scientific publications. In addition, collaboration fosters knowledge-sharing, facilitates interdisciplinary research, and strengthens the overall research ecosystem in Kenyan universities. Further, by leveraging digital platforms, libraries can provide online access to various academic resources, including e-books, online databases, and journals. Additionally, capacity-building initiatives can focus on empowering researchers and postgraduate students by offering workshops and seminars on research methodologies, information literacy, and academic writing.

4 Conclusion

In conclusion, academic libraries play a role in supporting research and postgraduate services in Kenyan universities. They provide necessary research resources, such as books, journals, and databases. They also provide digital tools and resources to support postgraduate research. This includes access to research databases, citation management tools and online repositories. However, these libraries face several challenges, including limited funding, insufficient infrastructure, staffing issues, technical expertise and low levels of information literacy among students. Despite these challenges, there are opportunities for academic libraries to improve their support for research and postgraduate services.

5 Recommendations

Based on the findings of this study, several recommendations can be made for future action to enhance the role of academic libraries in supporting research and postgraduate services in Kenyan universities. Firstly, it is essential to address the issue of limited funding by advocating for increased financial support from university administration, government entities, and external funding sources. Additionally, universities should invest more in improving library infrastructure and facilities, which is essential to ensure efficient and effective services. Furthermore, the Kenyan Government should address staffing issues by hiring qualified personnel and providing continuous professional development opportunities, which is vital for maintaining high-quality library support. There is also a need for university management to foster collaboration with research institutions and other libraries and embrace technological advancements that will contribute to better services and information access. Further, continuous evaluation and improvement are essential in enhancing academic libraries' role in supporting research and postgraduate services in Kenyan universities. Moreover, periodic evaluation enables libraries to measure their effectiveness in achieving their goals and benchmarks, enabling the implementation of evidence-based strategies for continuous improvement. Lastly, implementing capacity-building initiatives, including research skills training programs and workshops, will empower researchers and postgraduate students. By implementing these recommendations, academic libraries in Kenya can overcome challenges and seize opportunities to provide enhanced research and postgraduate support.

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33. The Implementation of Research Findings for LIS Professional Practices in Selected Academic Libraries in Sub-Saharan Africa

Jackline Kiwelu*; Justina E. Ogbonna CLN, SOMAC*; Gadiel Ketto***

*Aga Khan University, Dar Es Salaam, Tanzania
jackline.kiwelu@aku.edu

**Kampala International University, Kampala, Uganda
justina.ogbonna@kiu.ac.ug

***Aga Khan University, Dar es Salaam, Tanzania
gadiel.ketto@aku.edu

Abstract

Implementing research findings influences professional growth, provides evidence, and improves practice. Time and money go to waste if research findings are not adequately used. This study was set to understand how LIS Masters and PhDs research findings influence professional practices in academic libraries. The qualitative study used an online semi-structured interview to collect data from twelve (12) selected academic libraries in the Sub Sahara, Africa. Data was analysed thematically. The participants of this study attest that research findings from Master's and PhD students are integrated into activities and provide evidence for decision-making. However, no precise mechanism supported the implementation of the findings. Funding, lack of awareness, and resistance to change hindered the implementation of the research. There is no clear link between the researchers and the academic libraries. Academic libraries studied, tracked, and preserved the research using institutional repositories, though they neither have a clear research agenda nor are aware of their parent institutions' research agenda. The study recommends that academic libraries, to implement research findings effectively, can follow an eight-step-by-step procedure of best principles of implementation science, advocate, and collaborate with partners to secure funds for research. Though researchers have the freedom to decide the research problem, academic libraries should have a voice in some of the research to ease the implementation of the findings. Library schools should include the implementation of research findings or evidence-based practice as part of the research chain to spur innovation and creativity in LIS.

Keywords: *Research outcomes, evidence-based practice, LIS professional growth, knowledge translation*

1 Introduction

Implementation is a general term used by various disciplines. "The word "implement" comes from the Latin "implore," meaning to fulfil or to carry into effect." This definition helps to understand research implementation broadly, as it is about research effectiveness in practice, policy making, and usage. This study examines research implementation from the angle of using or adopting research recommendations, interventions, and innovations (Hewitt-Taylor et al., 2012). Implementation is a concept developed from a desire to use research for professional practices (Kent, 2019). Scholars in literature attest that there is a gap between translating research into practice and policy, which needs to be closed, and the interest in rectifying the anomaly is growing (Boaz et al., 2011; Joyce & Cartwright, 2020; Kent, 2019). Over the years, scholars have developed theories, frameworks, and models to help understand and develop strategies for implementing research into practice (Nilsen, 2015).

In Library and Information Science (LIS), like any other discipline, research helps professional growth, evidence-based decision, policy-making and practice (Kennedy & Brancolini, 2018). Through research, new ideas, theories, and innovations are realised and, when implemented, effectively improve service delivery. Hoffmann et al. (2014) argue that the need for academic librarians to participate individually

or collaboratively in research for personal or library growth can no longer be overemphasised. These scholars further explain that scholarship is a professional responsibility for many academic librarians for employment, promotion, and career development.

Library and Information Science schools in the selected countries in Sub Sahara Africa teach research processes and empower their students with the skills to carry out research, starting from the bachelor's degree to PhD levels. Academic libraries in universities are mandated to support researchers from all fields in accessing and using information resources to carry out research. Academic librarians must research and publish to contribute to professional growth and community development. Master's and PhD research costs money in fees, data collection, analysis and report writing. It also costs much time for the students and the supervisors; therefore, it is essential for the findings and the recommendations to be used in the profession. The information generated through research must be accessed and used to influence practice. Genoni et al. (2004) observe that there is a gap between research and practice not only in LIS but also in other disciplines. This observation was confirmed by Etomaru et al. (2022) and Elueze (2016) that research findings are not used as desired. Lack of time and motivation hinder librarians from embracing research implementation in their daily professional work (Luo, 2018). This study categorically looks at the Master's and PhD research carried out in the academic libraries in selected Sub Sahara Africa to evaluate how the research contributes to professional growth, decision-making, policy-making and information practices in these libraries.

2 Literature review

This study reviewed the literature on the theoretical perspective of implementation and its relationship with research implementation in academic libraries.

2.1 Research implementation theoretical perspective

Implementation theory developed from a desire to use research in health care practice and evidence-based medicine (Nilsen, 2015). Over the years, scholars have come up with theories, frameworks, and models to help understand and develop strategies for the implementation of research into practice in health sciences and other disciplines (Moullin et al., 2020; Nilsen, 2015; Titler et al., 1994). (Nilsen, 2015). However, in literature research, implementation theory is rare in other disciplines unrelated to health sciences.

This study finds the implementation theory or model by Titler et al. (1994) more relevant to explaining the research process in professional practice. Implementation of research requires outer and inner factors to be considered for its success or failure (David et al., 2013; Madrigal et al., 2022; McHugh et al., 2020; Moullin et al., 2020). The factors to consider include funds, political will, peer pressure and policies as outer factors (Bruns et al., 2019; David et al., 2013; McHugh et al., 2020), while institutional culture, leadership, funds or budgets, dedicated staff, and office as inner factors (David et al., 2013). The research implementation is done in three major phases (Damschroder & Hagedorn, 2011; Nilsen, 2015; Saldana, 2014; Titler et al., 1994), and each phase needs the outer and inner factors (Titler et al., 1994). Pre-implementation or preparation, implementation, and post-implementation phases (Nilsen, 2015; Titler et al., 1994). The pre-implementation phase comprises the finding phase, where the institutions determine the research needs or gaps, the available evidence and the required modalities or strategies to implement to put the evidence into practice. The implementation phase involved implementing the strategies agreed on to ensure the evidence or the findings in the research are used in the right place for the right reason. The post-implementation phase is when a sustainable strategy is established, including monitoring, evaluating and ensuring the process is maintained.

2.2 Implementation of research in the context of academic libraries

Literature about implementing research findings and recommendations in academic libraries is scarce. More research is needed to close the gap between research and practice in academic libraries, especially in Sub-Saharan Africa.

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Historically, librarians, like other professions, are known for doing research either as students or as workers and communicating it in the form of reports, theses, dissertations, journal articles, books and the like (Cox & Verbaan, 2016; Kennedy & Brancolini, 2018). Librarians acquire the best resources to support students, researchers, academicians, and faculty with information and improve services to the community. Little is documented about librarians acquiring resources to facilitate their research and improve skills and practice (Walster et al., 2016). On the other hand, little is known in most academic libraries how the research carried out in these libraries is implemented.

However, the situation is changing; academic librarians are not only getting engaged in research but also thinking about the implementation of this research to improve service, practice and decision-making in the form of "evidence-based practice, assessment, and accountability" (Kennedy & Brancolini, 2018, p. 822).

Furthermore, more libraries worldwide are adopting scholarly research as a requirement for tenure and promotion for academic librarians, especially in the USA, Canada, Australia and the UK, where young professionals find it challenging. Early career librarians need mentorship and training in research to cope. In Canada, research carried out about library administrator's engagement in academic librarianship revealed that the administrators need to be engaged to reduce some of the challenges academic librarians researchers are facing in the form of allocation of time, funds and motivation (Berg et al., 2013; Kennedy & Brancolini, 2018; Luo, 2018). These findings are not far from the recommendation by research implementation theorists that there is a close relationship between the outer and inner factors, which include funds, time, and motivation for research implementation to be successful (David et al., 2013; Madrigal et al., 2022; McHugh et al., 2020; Nilsen, 2015; Titler et al., 1994). Though the literature reports general research implementation theories, research implementation in health sciences, and what is required to implement findings, no study looked specifically at how master's and PhD research are integrated into LIS professional practice, the mechanism/policies or procedures for implementing research findings in academic libraries in the context of Sub-Saharan Africa, which is the gap this study is addressing.

2.3 Objective of the study

The research aims to investigate the influence of research findings from Masters' and PhD studies on the professional practices within selected academic libraries in Sub-Saharan Africa to propose or recommend a mechanism of findings implementation into practice. Specifically, the objectives are as follows:

- To examine the existence of a research agenda within the libraries that guides the implementation of research findings derived from Masters' and PhD studies.
- To assess the volume and scope of research conducted within these libraries over the past decade, providing insight into the extent of scholarly output.
- To analyse how findings from Masters' and PhD studies are integrated into the day-to-day practices of library and information science (LIS) professionals, thereby shaping their workflows and decision-making processes.
- To identify challenges encountered during the implementation of research findings, shedding light on potential barriers and areas for improvement in translating academic research into practical applications.

3 Methodology

The study was carried out from January to August 2023. It was qualitative; an online semi-structured interview was used to collect the required data. The participants were selected through a convenient sample method, where the participants who were easily reached and willing to participate in the study were examined. A convenient sampling method is a non-probability method for qualitative studies. Participants

are chosen when they are willing or have time and are available geographically to be part of the study. The study included twelve academic libraries in Sub Sahara that were conveniently selected. The participants were university librarians, senior librarians, and assistant librarians who had enough experience to provide the required data for the study. The participants were from selected academic libraries in Sub-Saharan Africa whose names are not revealed in this study for ethical purposes. The participants were from Uganda, Tanzania, Kenya, Zambia, South Africa, and Nigeria academic libraries.

The data analysis was done thematically based on the themes that arose from participants' opinions and research questions. Thematic data analysis is an approach qualitative researchers use to interpret and present meaning from data (Grbich, 2013). The researchers closely examined the data, grouped the common ideas identified about the research questions, generated themes, and compiled the findings in tables (Grbich, 2013) for easy understanding and explanations.

4 Findings

The study's findings are presented according to the summary of the themes.

4.1 Masters' and PhD research findings implementation into academic libraries in Sub Sahara Africa

The implementation process of the research findings starts with tracking the research itself. The participants were asked how their library followed up the LIS Master's and PhD research in their university libraries. The researchers intended to find out how the research was carried out in the academic libraries and how it was tracked. The responses are as reported in table 1 below:

Table 1: Tracking the research in academic libraries.

No.	Responses
01	We have an IR tool to track the research.
02	No, I do not know, or I have never had students carry out a study in our library.
03	Reviewed journals as part of their academic track
04	Researchers are requested to make the research available in the library before it is disseminated.
05	There is no intended effort to be given a report.

According to Table 1 above, the participants gave various ways they track the masters and PhDs research carried out in their libraries. Some said they use institutional repositories (IR) to track and preserve the research. Meanwhile, others did not know anything about tracking the research in their libraries. The participants were asked whether they were aware of the number of studies either at Masters' or PhD levels that were carried out from 2014 to 2023 September. Though participants indicated their awareness of the studies carried out, and they could estimate the number of the studies, some librarians expressed that they were not aware.

The library research agenda can be adopted from the overall university research agenda or have its own. Some participants said they have a research agenda or strategy, while others do not. Meanwhile, other participants said they were not sure.

The participants who said they were aware of the research agenda and tracked the Masters and PhDs dissertations or thesis were asked to mention the major findings and recommendations in them. These findings bring an understanding of areas of professional focus or practice where the findings can be applied. The findings are summarised and presented in Table 2 below:

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Table 2: Research focus

No.	Response
01	Library practice (librarianship) includes changes in policies and standards (e.g., budget allocation and adhering to Academic Research Libraries guidelines (ACRL).
02	Awareness of the library resources.
03	Information Literacy
04	Library systems/ ICTS

Table 2 above indicates the focus of research carried out in academic libraries in Sub-Saharan Africa. Most of the findings and recommendations focused on changing policies, standards, and budget allocations and improving library guidelines, information literacy, awareness, and library systems or ICTs.

4.3 Implementation of library research in the academic libraries

The researchers explored how the research findings were implemented in the academic libraries studied. These findings were to inform a step-by-step practice on how research findings can be implemented in academic libraries. The findings are summarised in table 3 below:

Table 3: Research implementation

No.	Responses
01	Nothing is done
02	Integrating it with the library working groups/activities
03	Very little is implemented. Some recommendations require funds, which libraries are still looking for to be implemented.
04	Use the research findings as evidence-based for decision-making and practice.

Table 3 above indicates how Master's and PhD research findings are implemented in academic libraries. Participants mentioned integrating the findings into library work groups or activities, while others said the research has enabled them to be evidence-based in their decisions and practices.

4.4 Challenges encountered when implementing research findings in academic libraries

The study examined the challenges and difficulties selected academic libraries in Sub Sahara Africa experienced when implementing research findings from Masters and PhDs. The findings are presented in table 4 below:

Table 4: Challenges in research implementation

No.	Challenges
01	Lack of funding, budget
02	No framework or system to track the research
03	Resistance to change, the library cannot accommodate the findings and recommendations.
04	No clear research agenda in the library.
05	Lack of cooperation with faculty.
06	Lack of awareness of the need to keep track of the research carried out in the library.

The selected academic libraries where research was carried out were asked to mention the challenges they experienced while implementing the research findings and recommendations in professional practices. Six groups of challenges were recorded, as seen in Table 4 above. Some participants said the research findings and recommendations required much money, which the library could not afford because they were not implemented.

It was challenging to keep track of the research that was carried out. The failure to have a clear library research agenda made it challenging to implement research in academic libraries.

5 Discussions

The discussions are presented about the findings presented above.

5.1 The library research strategy or agenda

For research findings integration in academic libraries to be well implemented, it is essential for an academic library to have a research agenda (Peters et al., 2013) or at least adopt the parent institution agenda and come up with a strategy on how to incorporate it with the research carried out in the libraries. This helps the library to have direction for the research and channel it well in the areas of need, which will also make the research relevant to the needs of the libraries. Therefore, since academic libraries are there to support and carry out research, they should have a research agenda providing guidance. Adopting a principle or policy/strategy for implementing science/research will ensure that research becomes part of the academic libraries in Sub-Sahara Africa. The research agenda is a pre-implementation phase where the implementation process is defined. The outer and inner factors such as funding, budgets, staffing, time and other resources required are put in place as recommended by David et al. (2013) (Madrigal et al., 2022; McHugh et al., 2020; Nilsen, 2015; Titler et al., 1994).

5.2 Improve library practices as evidence

Participants mentioned integrating the findings into the library work groups or activities, while others as evidence to influence practice and improve services and decisions. These findings align with those of (Kennedy & Brancolini, 2018) that research influences evidence-based practice and makes the institution operate in the right direction.

The research participants mentioned the challenges experienced while implementing the research findings and recommendations in the professional practices, such as lack of funds, lack of research strategy, budgets, some recommendations needing vast sums of money and resistance to change. These findings agree with other scholars who suggest in the literature that research implementation requires budget support in various phases, from pre-implementation to implementation phases and sustainability or post-implementation (Nilsen, 2015; Titler et al., 1994).

Generally, what is already known is that it is essential to integrate research findings into professional practice; however, how the research findings are to be integrated to influence LIS professional practice in academic libraries is not well known where this study fits. The study emphasises the importance of academic libraries in Sub-Saharan Africa having their research agenda or aligning closely with the research agenda of their parent institutions for effective implementation of the findings. This ensures that library research efforts are relevant to the library practices.

Highlighting the challenges faced in implementing research findings into library practices, particularly in Sub-Saharan African academic libraries, such as lack of funds, absence of a precise research implementation mechanism, budget constraints, and resistance to change, creates awareness among administrators when they intend to implement research findings.

Drawing upon existing literature to support the argument, such as Peters et al. (2013), David et al. (2013), Kennedy and Brancolini (2018), Nilsen (2015), and Titler et al. (1994), the study provides a comprehensive understanding of the importance of implementing research findings for professional growth, and improved practice for academic libraries. It provides a contextualised perspective on academic library research practices and specific challenges to Sub-Saharan Africa, which may differ from those faced by libraries in other regions due to resource limitations and varying institutional contexts.

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6 Conclusion

For smooth and efficient professional practices in academic libraries, there should be clear-cut ways of not only tracking all the LIS Master's and PhD students' research relating to academic libraries functions and services but also ways of implementing the results and recommendations from the research with budget lines and precise mechanisms. This means that there should be a unit created in every academic library with a clear mandate to oversee the tracking, analysing, implementing, building capacity, recommend different functional monitoring, and evaluate the implementation into professional growth.

7 Recommendations to academic libraries in Sub-Saharan Africa

Below are the recommendations that participants gave to academic libraries regarding implementing research findings.

- Libraries should advocate, lobby, and collaborate with other partners to secure more funds. They should also look for funding beyond their parent institutions.
- Align library services with the best available evidence.
- Adopt the best principles of implementation science because research brings out ideas that improve library practices and operations. Through research, areas of weakness are identified and can be improved.
- Every library should have a clear research agenda. This agenda will ensure that efforts contribute to the development of the library and the university.
- Professional bodies should create awareness among academic libraries. The participants must create awareness of implementing research findings across academic libraries in Sub-Saharan Africa.
- Academic libraries should develop an inventory of all the research and identify the findings suitable for integration into library practices.

As part of the recommendations given by the participants above, the researchers find this study to have a practical implication for narrowing the gap between research findings and practice in academic libraries in Sub-Saharan Africa. Implementation of research findings should be encouraged and supported in libraries to improve practice and contribute to better services. The library administrators should have a policy on research implementation and agenda in academic libraries to monitor and provide financial, time and moral support to the researchers. The libraries where this research is carried out should benefit from the findings and manage how these findings and the recommendations are implemented. Through this study, the researchers propose an eight-step procedure for integrating Master's and PhD research findings implementation in academic libraries for professional practice in Sub-Saharan Africa and beyond, as seen in Figure 1 below. The researchers believe that by following these steps while localising them to the specific context of academic libraries in Sub-Saharan Africa, research findings can be effectively implemented to improve LIS professional practices and ultimately enhance the quality of library services. Furthermore, the researchers suggest that library schools implement research findings or evidence-based practice as part of the research chain to spur innovation and creativity and encourage action research in LIS.
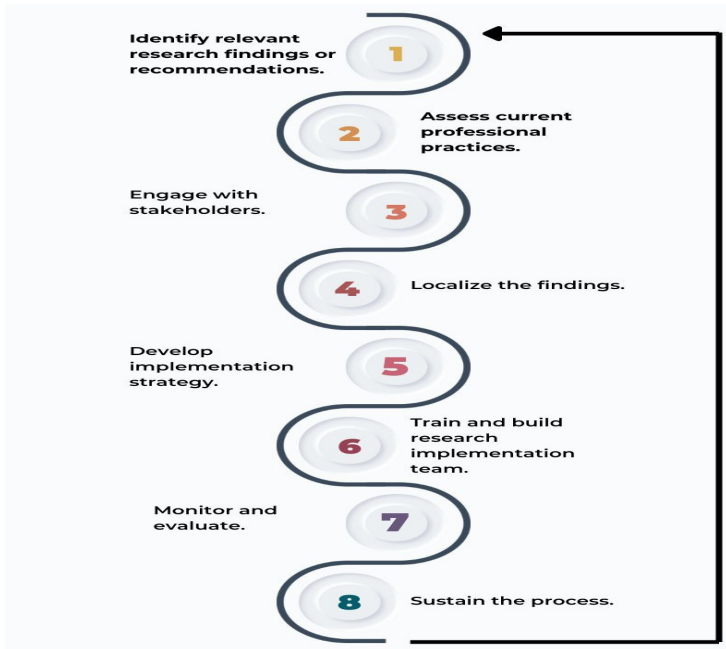
Figure 1: A model for implementing research findings in academic libraries

- **Identify relevant research findings or recommendation**s: The starting point is to review and identify the existing research findings in the Masters and PhDs relevant to the specific needs according to the area of focus in the academic libraries in Sub-Saharan Africa.

- **Assess current professional practices**: Before implementing any findings, it is essential to understand the current practices and activities within the selected academic libraries. The assessment helps to identify areas of practice or where the findings can be integrated.

- **Engage with stakeholders**: Working with other stakeholders within and outside the academic libraries will ensure necessary support, including finances and sustainability of the process, and avoid resistance to change. Depending on the nature of the findings or the area of focus, stakeholders like the university administration department, university librarian, faculty, students, and IT department may be consulted for necessary support.

- **Localise the findings to the specific library need**: It is essential to bring the research findings home or in the local context to fit well with the library's vision, mission, and goals. The adaptation will help consider certain factors, such as a unit to spearhead the implementation and the resources, technology, culture, and practice needs.

- **Develop an implementation strategy**: Based on the research findings and the local context, developing specific strategies for implementing changes within academic libraries is essential. These strategies may include policies, procedures, plans, services, or infrastructure.

- **Train and build a team**: Implementing new professional practices may require training and building capacity for library personnel. Mentorship programmes, workshops, seminars, and official online or offline courses help librarians have the necessary skills and knowledge to implement changes effectively. Having a dedicated library personnel team to spearhead research findings implementation, innovation, and creativity will make integrating research findings into library practices easier.

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- **Monitor and evaluate**: Throughout the implementation process, monitoring progress and evaluating the impact of the changes is essential. This can involve collecting data on usage statistics, user satisfaction, and other relevant metrics to assess the effectiveness of the implemented strategies.

- **Sustain the process**: After monitoring and evaluating the implementation, there could be areas in the professional practices identified that need improvement or updating, which will require more research. Therefore, the library research agenda can include those areas that need improvement and further research. Sustained research life in academic libraries will make libraries evidence-based, innovative, creative, trendy, efficient and more effective in the changing and growing world of information.

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34. Applying SWOT Analysis to Assess Drivers and Barriers to Using E-resources Among Selected Academic Libraries in Uganda

Bosco Apparatus Buruga*; Ali, Guma**; Ronald Izaruku***

Muni University
*burugakk@gmail.com; **a.guma@muni.ac.ug

***Lira University*
izarukuronald@gmail.com

Abstract

The high costs of printed textbooks and the closure of some libraries in 2020 due to COVID-19 negatively affected many developing countries' education and library services. As a result, institutions and universities were forced to utilise electronic information resources (EIRs) to offer library information services and resources to library users. The study aims to assess drivers and barriers to electronic information resource usage in academic libraries in Uganda using a SWOT analysis. The findings will assist libraries and library consortia in making justifiable decisions regarding the selection of EIRs. The study employed a descriptive design to collect quantitative data and a stratified random sampling technique to select the sample size. A structured questionnaire was designed using Google Forms and administered online to the Muni and Lira universities' teaching staff and final-year students, where 103 were filled by teaching staff and 248 by final-year students. The data collected were analysed using the SPSS Version 28 and RStudio software. The study findings show that most respondents agreed that librarians exposed them to all the library EIRs and that it was essential to access EIRs to benefit from its services. The study also identified knowledge and skills, the relevance of EIRs, availability of technological infrastructure and resources, awareness and adaptation, perceived ease of use and access, previous experience, institutional policies, and perceived quality content as the critical drivers for the usage of EIRs in academic libraries.

Keywords: *EIRs, drivers, SWOT analysis, university libraries, teaching staff, students, northern Uganda*

1 Introduction

The expensive cost of setting up and maintaining a physical library, coupled with the closure of the physical doors of library buildings in Uganda due to COVID-19 at the beginning of the year 2020, made some libraries struggle to help their clients utilise the available library information services and resources. The urge for library services increased when the government allowed institutions to conduct online classes through Open Distance and Electronic Learning (ODeL). Learners, teaching staff, and researchers require information services to run their businesses, and using EIRs is handy. However, their adoption and use in low-income countries is a concern raised by some scholars due to the infrastructural challenges, limited relevant electronic information content in eBooks eJournals, and little knowledge of the usage of EIRs (Leonard & Snyman, 2019; Makozho, 2020; Tsekea & Chigwada, 2021).

In Uganda, most academic libraries provide digital and print library resources to their clients for convenient and reliable information (Azonobi et al., 2020; Bhardwaj & Sharma, 2022). Schellnack-Kelly et al. (2021) define EIRs as digital resources like eDatabases, eJournals, eBooks, CD-ROMs, digital archives, intranet and web-based technologies. Mukhtar and Maidabino (2021) and Merande et al. (2021) add that these are information resources offered in electronic format by libraries to their clients to be accessed using digital machines such as computers, tablets, and smartphones. Some of the EIRs are online resources (e.g., e-books, e-journals, e-newspapers, e-databases, e-patents, e-standards, e-theses, scientific web resources, Online Public Access Catalogue (OPAC), e-clippings, e-forums, e-magazines, e-newspapers, digital repositories,

e-mail publishing, bibliographic databases, search engines, and e-blogs) or offline resources (stored on CD-ROM, DVD, & magnetic tapes) (Pitla et al., 2020; Al Sawy, 2021; Merande et al., 2021; Bentil et al., 2021).

The EIRs are essential resources for contemporary library services that offer a vital supportive role in the conduct of research (Sohail & Ahmad, 2017; Leonard & Snyman, 2019) and improve teaching staff effectiveness and productivity in facilitating teaching and learning (Mollel & Mwantimwa, 2019). EIRs are prevalent in contemporary libraries because of their availability anywhere and anytime, ease of amending and update, portability, multiple access to one resource by many users, ease of print and save, searchability, and relatively cheap, especially the open-access resources (Babarinde & Onifade, 2019; Leonard & Snyman, 2019; Leonard et al., 2020; Al Sawy, 2021).

Northern Uganda is one of the historically disadvantaged regions, a semi-rural area with poor electricity connectivity, poor ICT infrastructure, and students and teaching staff from underprivileged backgrounds (Ali et al., 2019). It is blessed with three (3) public universities, two (2) private universities and four (4) constituent colleges of other Ugandan universities. The public universities include Gulu University, Muni University and Lira University. At the same time, the private universities are Nile University and Sacred Heart University. The law governing universities and other tertiary institutions mandates that all higher institutions have their well-stocked library(ies) with relevant textbooks, ICT equipment, and software and managed by professional library staff (i.e., library assistants, assistant librarians, librarians, senior librarians, and university librarians). This study was carried out at Muni University and Lira University. The choice of these universities was based on the fact that they are fully paid-up members of the Consortium of Uganda University Libraries (CUUL), paid for the subscription of electronic resources in 2021 and have access (both on-campus and off-campus) to a variety of learning EIRs.

Membership in CUUL enables member institutions to benefit from collective bargaining power and have better access to electronic resources. The consortium prices for EIR's license fees are relatively lower for the members than paying individually. Member institutions have access to millions of eJournals articles and eDatabases, subscribed through CUUL (Mulumba, 2020; Bwalya & Ssebbale, 2017); these resources are accessible over the Internet through the library websites and CUUL website. Although Ugandan university libraries invested in acquiring EIRs, the resource usage is low. This has been reported by CUUL every year in their annual general assemblies attended by the researchers. The low use of these resources worries librarians because the statistics do not show the value of money spent on subscriptions to these resources.

Despite the investments in EIRs and services in some libraries in Uganda, their effectiveness has not been assessed. In unusual situations, such as the one created by the COVID-19 crisis, the library information services and resources are tested (Tsekea & Chigwada, 2021). Therefore, it is paramount that libraries assess drivers for the usage of EIRs and how relevant the current resources and services are to their clients by evaluating their internal competencies and shortcomings and the opportunities and threats from the surrounding so that effective strategies can be considered for offering better services to the community. The SWOT analysis is a valuable means by which libraries assess themselves with the environment in which they operate. An evaluation study needs to establish the reasons for the low usage of these resources. Otherwise, the teaching staff may not effectively gain from the role of libraries in supporting them in executing their core teaching-learning, research, and community engagement mandates. This justifies why this study is essential in assessing the drivers and barriers to EIRs usage in academic libraries in Uganda using SWOT Analysis by teaching staff and final year students of Muni and Lira universities.

Most studies on SWOT analysis on EIRs in libraries are from developed nations. Students and teaching staff who influence the selection and usage in developing countries such as Uganda have not been given priority, yet the reading culture is poor, and the use of EIRs is so low. To minimise the gap, this study focused on teaching staff and final-year students in a semi-rural part of northern Uganda universities. The study findings will generate ideas that the universities, libraries, and library consortia can use in decision-

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making regarding choices of EIRs selection. The study attempted to answer the following research
questions to achieve the main aim:

- What is the level of awareness of the teaching staff and final-year students regarding the use of
  EIRs in Uganda's academic libraries?
- What are the drivers for the teaching staff and final-year students' use of EIRs in academic
  libraries in Uganda?
- What are the strengths, weaknesses, opportunities and threats (SWOT) of using EIRs in Ugandan
  academic libraries?

2 Review of related work

This section presents a review of scholarly works related to the issues being investigated in this paper.

2.1 Use of EIRs in academic libraries

Researchers, teaching staff, and students use EIRs for various purposes, such as academic purposes (i.e.,
course works, completing assignments, research, compiling teaching and learning materials, preparing
seminar presentations, and disseminating and preserving research findings), acquiring development
ideas, communicate and collaborate with friends and classmates, improve knowledge, online registration,
materials for a writing project, career development, efficient retrieval of information, curriculum design,
and recreation (Chuks-Ibe et al., 2018; Adedokun & Fawole, 2018; Alkhafaji & Samea, 2020; Leonard et al.,
2020; Gautam & Sinha, 2020; Hendal, 2020; Achugbue & Ahimbisibwe, 2020; Osinulu, 2020; Bhardwaj &
Sharma, 2022; Liasu & Bakrin, 2022).

Electronic information resources in academic libraries are essential to researchers, teaching staff, and
students because they provide a comprehensive and vast amount of information that users can quickly and
cheaply access in electronic forms in its latest form (Al Sawy, 2021; Armah & Cobblah, 2021; Bhardwaj &
Sharma, 2022); it helps users to advance their research work (Burhansab et al., 2020); it is readily available as
long the users have access to the network or Internet connectivity (Azonobi et al., 2020); flexible in terms
of storage and interoperable since they are dynamic resulting into the wide dissemination of information;
convenience since a piece of data can be easily searched (Schellnack-Kelly et al., 2021; Bhardwaj & Sharma,
2022). Besides, EIRs can easily and simultaneously be accessed by multiple off-campus users in a short
period (Merande et al., 2021); EIRs are up-to-date, trustworthy, and appropriate, access a wide variety of
information, and the time and location of access are unlimited and unrestricted and saves physical spaces
(Hossaini, 2017; Schellnack-Kelly et al., 2021). Mollel and Mwantimwa (2019) observed that library EIR
usage depends on the relevancy of the content and users' skills to navigate the different electronic resource
platforms, search engines, and interfaces. The authors further alluded that the usage of EIRs increases
not only when the library avails resources and services that meet their users' demands but also when they
own the required skillsets for accessing the EIRs. Tlakula and Fombad (2017) emphasised the importance
of possessing needed skills. They assert that library users can effectively utilise the library services by
expanding the information literacy programmes to all students and academics.

2.2 Electronic information resources awareness in academic libraries

Through the awareness of EIRs in academic libraries, the academic community has widely adopted and
used electronic resources to meet its information needs. Understanding EIRs looks at users' knowledge
and skills for accessing and using the available electronic resources effectively and efficiently anytime
and anywhere when needed. These knowledge and skills help users know the means available to access
electronic information.

EIRs and library services were anticipated to increase during COVID-19 (Mbambo-That, 2020; Tsekea & Chigwada, 2021). However, this would be possible if the libraries developed effective response plans and strategies. With the increasing rate at which higher learning institutions progressively adopt and adapt online learning, libraries' role in providing online content will be paramount. As such, Mbambo-That (2020) advocated that libraries should develop digital library usage plans consisting of awareness creation, marketing library EIRs, online support services, subscribing to relevant EIRs content for the academic programmes, evaluation of its online service provision, and negotiating with publishers for a reduction in subscription fares.

The low usage of EIRs in Africa became a concern for many librarians; hence, studies were done, and the results varied from one study to another. For example, the survey conducted by Leonard et al. (2020) on electronic resources by law academics at the University of Namibia found that 100% of the Law faculty members were aware of the e-resources subscribed to, although the usage of the resources remained low. The studies by Yebowaah (2017), Ahmed and Al-Reyaee (2017), and Adeleke and Nwalo (2017) reported that the majority of the users were aware of electronic resources and also highlighted the benefits of the awareness of EIRs to the academic community. Similarly, Ncube and Tarumbira (2016) studied using e-resources at the Zimbabwe Open University Midlands Library. The results revealed that 75% of users were aware of e-resources in the library. Another study in Nigeria also found that postgraduate students were aware of EIRs and used them in the library (Akpojotor, 2016; Azubuike & Azubuike, 2016). A similar study by Chepukaka (2017) in Kenya found that 100% of respondents knew of the EIRs. However, the study concluded no positive relationship exists between awareness and actual usage of the EIRs. Besides, a similar study in Nairobi, Kenya, found awareness and use of electronic resources to be high among male students (Gor et al., 2016).

Meanwhile, in Uganda, Gakibayo et al. (2013) studied EIR usage by students at Mbarara University Library; they found that students lacked awareness of the resources and their relevancy. A related study in Uganda at Nkumba University on factors influencing access and usage of e-resources (Bwalya & Ssebbale, 2017) recommended that librarians spend more time mastering their EIRs contents to create awareness about them in the University community. In addition to the creation of awareness of the EIRs among faculty members, Hendal (2020) is of the view that the collection and development of the EIRs should be done collaboratively between the librarians and the faculties they serve so that the items selected and procured are the right ones needed by the teaching staff. The collaborative work between teaching staff and librarians enhances relevant collection development and establishes a communication link between the library and the faculty.

2.3 Drivers for the usage of EIRs in academic libraries

The literature review identified some essential drivers motivating the usage of EIRs in academic libraries, and are discussed below:

2.3.1 User competence and skills

Skills for information retrieval and evaluation are essential for the optimal utilisation of EIRs (Al Sawy, 2021). To effectively use EIRs for teaching, learning and carrying out research in the era of information explosion, one must possess a set of skills for defining the problem at hand, identifying the right source of information, retrieving accurate, relevant, and recently published reports (Isibika & Kavishe, 2018; Ehioghae et al., 2020). The required skills for utilising EIRs have been elaborated on in many studies and must be tackled to better search, retrieve, evaluate, and use the articles (Leonard et al., 2020; Gautam & Sinha, 2020; Hendal, 2020). Tlakula and Fombad (2017) believe that the lack of skills for the search and usage of EIRs in academic libraries is due to inadequate guidance given by librarians. Appointing faculty liaison librarians offers a better alternative (Machimbidza & Mutula, 2020). The authors further argued that faculty librarians who work with academics and researchers enhance collections of relevant EIRs and create awareness. This means that when the relationship between librarians and faculty is good, a conducive environment catalyses EIR usage.

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2.3.2 Relevance of EIRs

The relevance of EIRs to teaching staff matters a lot in terms of their usage. A study conducted by Machimbidza and Mutula (2020) in Zimbabwe established that academics do not adequately use EIRs in their institutions because their libraries subscribe through consortiums that do not address their need. The decisions of consortia on what to subscribe to are majorly on resources that benefit many institutions with less focus on subjects unique to faculties (Babarinde & Onifade, 2019; Machimbidza & Mutula, 2020).

2.3.3 Technological infrastructure and resources

Tlakula and Fombad (2017) and Isibika and Kavishe (2018) suggest that EIRs are facilitated in an environment where technological infrastructure such as intranet and Internet connectivity is good and fast, computing hardware and software, and human resources with the skill set to offer support services. Faster Internet connectivity is essential for accessing some electronic resources (Al Sawy, 2021). In Chepukaka's view (2017), human support services are critical in user training, troubleshooting, and changing the minds of those with negative attitudes towards EIRs.

2.3.4 Institutional policies

Chepukaka (2017) suggested developing institutional policies that support and promote electronic resources to develop teaching and learning materials and support decision-making and development of institutional operational documents such as guidelines to achieve maximum utilisation of EIRs in an institution. Chepukaka (2017) further adds that institutions whose ICT-related policies recognise the importance of technology advancement in their operations will facilitate the usage of EIRs.

2.3.5 ease of usage and access to EIRs

Chepukaka (2017), Isibika and Kavishe (2018) and Leonard and Snyman (2019) observe that EIRs are easier to use once library users know where to access these resources. Creating access points such as websites and library online catalogues with clear labels for electronic resources makes it simple for the users to notice and access them. However, Bwalya and Ssebbale (2017) note that the requirement for passwords every time a user attempts to access a resource from the library discourages library users from using EIRs. This is because contemporary computer users have too many login passwords that they hardly remember.

2.3.6 Perceived usefulness

Perceived usefulness in the context of EIRs usage is defined as the degree to which users believe that using EIRs would enhance their job performance (Azonobi et al., 2020). When the students and teaching staff efficiently use EIRs, they influence other academic communities to embrace them (Akpojotor, 2017; Azonobi et al., 2020).

2.3.7 Self-efficacy

Self-efficacy refers to one's belief that using the EIRs can achieve the required goals. Users with computer skills and high self-efficacy can access and search the EIRs from academic libraries to achieve their primary goal. However, people with low self-efficacy in EIRs are expected to access less electronic information (Azonobi et al., 2020).

2.3.8 Trust

Azonobi et al. (2020) define Trust as the reliance on the ability and strength of EIRs. When EIRs are trustworthy, the academic community will use them to access their information needs.

2.3.9 Social factors

According to Isibika and Kavishe (2018) and Azonobi et al. (2020), researchers, teaching staff, and students are motivated to use EIRs by their peers who are already using them.

Other drivers influencing teaching staff and final-year students to adopt the usage of EIRs in academic libraries are convenience, searching skills, quality information, and exposure to EIRs (Ahmed & Al-Reyaee, 2017; Isibika & Kavishe, 2018).

2.4 The SWOT analysis of EIRs

Providing quality service to customers is essential for most institutions, including libraries. Several tools are developed to guide the evaluation of the quality-of-service provision; one such tool, according to Harris (2018), is the SWOT analysis. Kaushik (2018) defines SWOT analysis as a "framework which can be used as a tool for strategic planning and decision-making in implementing a product, concept, project, successfully" (p. 11). In libraries, SWOT analysis is a valuable tool for strategic planning in understanding its strengths and opportunities to mitigate possible threats and weaknesses (Kumar, 2012). SWOT analysis also helps libraries measure their impact on the faculties and community they serve, primarily by establishing their contribution to institutional research output (Ho, 2020) and measuring the relevance of the libraries' EIRs to their community (Bentil et al., 2020). The outcome of the SWOT analysis is expected to help the library address areas where EIRs' performance is not good by capitalising on their strengths and available opportunities in their environment.

2.4.1 Strengths

Kumar (2012) defines strength as the advantage(s) an institution gains in using a resource or possession much needed to achieve its goals and objectives. In this paper, the strength of the EIRs is measured as a contributor to the achievement of library goals and objectives of the faculty members. EIRs promote multiple access to library resources anytime and everywhere without limit (Darandale, 2017). The author further asserts that EIRs improve library users' interactivity with electronic items. Users can easily browse, copy, and paste content from a given resource and quickly transfer it to word processing software to develop a document or manuscript. Makozho (2020) adds that EIRs are authentic and trusted research sources because their content undergoes peer review before publication is made available. Relatedly, Chepukaka (2017) opined that EIRs help academics address the challenge of outdated print reading materials in the library by providing an alternative updated learner study material with recently published references. According to Yang (2012), digital libraries promote quicker user interaction with librarians (online reference services). The network environment in which digital libraries operate enables on-site and off-site information sharing. Electronic resources are portable – a user can hold a library of over a thousand electronic books and journals through a mobile device to search within the electronic resource item and copy and paste the content (Leonard & Snyman, 2019).

A similar study done in Kerala (India) academic libraries by Kumar (2012) found that contemporary library users benefit from their libraries because librarians possess training skills, computing equipment and a fine collection of electronic resources. Chepukaka (2017), Mbambo-That (2020), and Kumar (2012) found that contemporary libraries are supporting their stakeholders by having access to their electronic library resources and services remotely without being in a library building through the use of a virtual private network (VPN) software such as RemoteXs and EZproxy access platforms that make the library resources accessible outside the institution public Internet coverage. Most contemporary academics are computer-competent and frequently use them daily (Ehioghae et al., 2020). ICT skills are essential enablers of using EIRs in an institution (Leonard et al., 2020). Similarly, the appointment of faculty librarians has opened up an opportunity for libraries to collaborate with their faculty members in areas of EIR selection and promotion of their usage (Leonard et al., 2020; Bentil et al., 2020).

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2.4.2 Weaknesses

According to Kumar (2012), a weakness is a "*debility, fault, defect, or limitation in the organisation that prevents achieving its objectives*". Access to EIRs is limited to several issues in developing nations. Darandale (2017) noted that most EIRs are not locally published. The institutions that subscribe to them do not control their usage and accessibility due to their strict terms and conditions. In addition to that, Dehigama and Dharmarathne (2015) and Azonobi et al. (2020) observed that most traditional librarians are not technologically competent for the task at hand in managing and providing support to their users to access EIRs. Makozho (2020) and Liasu and Bakrin (2022) noted that some of the weaknesses of the use of EIRs include a lack of digital literacy skills and information overload due to several EIRs in libraries, multiple password login requirements and the regular changes of these passwords by librarians for security reasons and not communicating these changes to library EIRs users. Other significant weaknesses of relying on EIRs as library resources are unawareness, lack of ICT infrastructure, lack of training, inadequate availability of the resources in libraries, lack of constant power supply, discomfort in reading electronic resources due to the rays emitted from the computer monitors, difficulty of identifying relevant information for the users' needs (Tella et al., 2018; Adeyinka et al., 2018; Mollel & Mwantimwa, 2019; Acheampong et al., 2019; Achugbue & Ahimbisibwe, 2020; Schellnack-Kelly et al., 2021; Merande et al., 2021; Liasu & Bakrin, 2022). Leonard and Snyman (2019) pointed out the "in-compatibility" and file format issues of eBooks that cannot be read on some computers that do not have the required software. These formats include Adobe Digital Edition, Portable Documents Formats (PDF), and Mobi.

2.4.3 Opportunities

Studies by Kumar (2012) and Sohail and Ahmad (2017) believed that institutions stand to benefit from EIRs only when there is an enabling environment. The rapid expansion of mobile telecommunication networks with the reduced Internet data prices in Uganda, according to Ali et al. (2019), is an enhancer of access to electronic learning resources. Darandale (2017) observed that EIR publishers promoted multidisciplinary research to one publication that benefitted many disciplines. The author noted that libraries have software to buy to enable blind people to read EIRs.

2.4.4 Threats

Access to EIRs requires payment of subscription fees; unfortunately, the ever-increasing costs of procuring some of the EIRs constrain accessing and retrieving full-text content needed for the intended function (Hendal, 2020). The limitations of intellectual property rights on how much a given resource can be used and shared, the unfriendly copyright laws also limit the usage of EIRs (Yang, 2012; Pokorná et al., 2020), safety questions about network securities and the use of personal data collected by EIRs platforms and publishers (Yang, 2012). Some of the EIR's publishers/platforms find searching and downloading content challenging due to the platforms' poor design interfaces, especially those without a search engine. As such, library users prefer to use Google for their research studies because it is user-friendly and easy to retrieve resources (Makozho, 2020; Hendal, 2020), and some library resources are not easily accessible because the library websites where the EIR's links are hosted are not well organised. Others are often off when needed (Makozho, 2020). Likewise, the inaccessibility of EIRs due to the public Internet restrictions and poor marketing strategies of the library's electronic resources and services were noted as a weakness in using EIRs in libraries (Chepukaka, 2017; Mbambo-That, 2020). Ternenge and Kashimana (2019), Achugbue and Ahimbisibwe (2020), Leonard et al. (2020), Makozho (2020), Merande et al. (2021), and Liasu and Bakrin (2022) further reported that inadequate electricity supply and stability, poor Internet connectivity in rural areas and low bandwidth, low publicity, and the unfavourable changes in use agreements terms by EIR's publishers and aggregators are some of the threats to EIRs usage. Finally, dwindling donor support to libraries has been noted as a threat to the sustainability of EIR payment in academic learning institutions

in developing countries such as Uganda (Okello-Obura & Magara, 2008). This may affect their adaption as learning materials in the long run by academics.

3 Methodology

The survey study adopted a descriptive research design to collect quantitative data concerning the current status of the phenomena from the study area. An online questionnaire using Google Forms was used to collect quantitative data from the respondents. A scenario-based questionnaire was developed and pre-tested with a few respondents, and the outcome was applied to improve some questions. The questionnaire contained questions targeted at soliciting answers to the research questions - (a) What is the level of awareness of the teaching staff and final year students on the current EIRs at their university library(ies)? (b) What are the drivers for the teaching staff and final-year students' use of EIRs in academic libraries in Uganda? (c) What are the strengths, weaknesses, opportunities and threats of using EIRs in Ugandan academic libraries? Ethics committees approved the research.

The study was conducted in two (2) public universities in Northern Uganda, i.e., Muni and Lira Universities, and the target respondents are teaching staff and final-year students. The choice of the study is influenced by an assumption that if the academics use the EIRs, their students will also likely use the resources. A stratified random sampling technique was used in this research to group the population into strata of teaching staff and final-year students. This helps to get more precise estimates for each stratum because it is more homogeneous than the total population. By estimating each part more precisely and accurately, the researcher gets a better estimate of the whole. The Yamane formula below was used to establish the sample size for the study with a 95% confidence level (Yamane, 1973).

n=N1+Ne²

A structured questionnaire was designed and divided into three (3) parts - the social demography characteristic of respondents, such as the respondent's gender, qualification, school/faculty, and duration of EIR usage. The second part covered the awareness and drivers for the usage of EIRs in academic libraries in Uganda. Finally, the third part was a five-point Likert scale covering the SWOT analysis of EIR's use in Ugandan academic libraries. Closed-ended questions and a five-point Likert scale were employed for the study. In a population of 140 teaching staff and 700 final-year students in both Muni and Lira Universities, a sample size of 104 teaching staff and 254 final-year students were selected using the Yamane formula. Only final-year students were considered for the study because they were the only students attending online classes and using EIRs during data collection due to the lockdown. Out of 358 online administered questionnaires, 244 (68.2%) fully completed questionnaires were returned, of which 67 (27.5%) were filled by teaching staff and 177 (72.5%) by final-year students of the two universities, with a response rate of 68.2%. The collected data were analysed using SPSS Version 28 and RStudio software. Statistical techniques like descriptive analysis (i.e., percentages, means, standard deviations, and graphs) were used in the data analysis. For five-point Likert scale data, results for the mean ≥ 3.41 were considered statistically significant (Pimentel, 2010).

4 Findings

The findings from this research are structured into three (3) sections: social demography characteristics, awareness and drivers of EIRs usage in academic libraries in Uganda, and a SWOT analysis of EIRs usage in Ugandan academic libraries to answer the research questions.

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4.1 Social Demography Characteristics

4.1.1 Respondents' gender, school/faculty, and duration of EIRs usage

Eighty-two-point, one per cent of the teaching staff, were male, 17.9% were female, none preferred not to say; 68.4%, 31.1%, and 0.6% were male, female, and like not to say in case of the final year students, respectively; 6.0% of the teaching staff belong to the Faculty of Education, 23.9% to Faculty of Technoscience, 26.9% to Faculty of Health Sciences, 19.4% to Faculty of Science, 14.9% to Faculty of Management Science, and 9.0% to Faculty of Agricultural & Environmental Sciences. In contrast, 29.4%, 7.9%, 48.0%, 14.1%, and 0.6% of final-year students belong to the Faculties of Education, Technoscience, Health Sciences, Science, and Management Science. Concerning the duration of EIR usage, 9.0% of the teaching staff reported using EIRs for less than 1 year, 37.3% between 1–5 years, and 53.7% for more than 5 years. For final year students, 7.9% used for less than 1 year, 83.6% between 1–5 years, and 8.5% for more than 5 years. The findings from the analysis are summarised in Table 1.

Table 1: Respondents' gender, school/faculty, and duration of EIR usage

No	Variable	Teaching Staff No. (%)	Students No. (%)
1	**Gender**		
	Male	55 (82.1)	121 (68.4)
	Female	12 (17.9)	55 (31.1)
	I prefer not to say	0 (0.0)	1 (0.6)
2	**School/Faculty**		
	Education	4 (6.0)	52 (29.4)
	Technoscience	16 (23.9)	14 (7.9)
	Health Sciences	18 (26.9)	85 (48.0)
	Science	13 (19.4)	25 (14.1)
	Management Science	10 (14.9)	1 (0.6)
	Agricultural & Environmental Sciences	6 (9.0)	0 (0.0)
3	**Duration of EIRs Usage**		
	Less than 1 year	6 (9.0)	14 (7.9)
	Between 1-5 years	25 (37.3)	148 (83.6)
	More than 5 years	36 (53.7)	15 (8.5)

4.1.2 Respondents' qualification (teaching staff), study programme level, and programme name (students)

As shown in Figure 1, 19-point-four per cent of the teaching staff have bachelor's degrees, 62.7% have Master's degrees, and 17.9% have PhD.
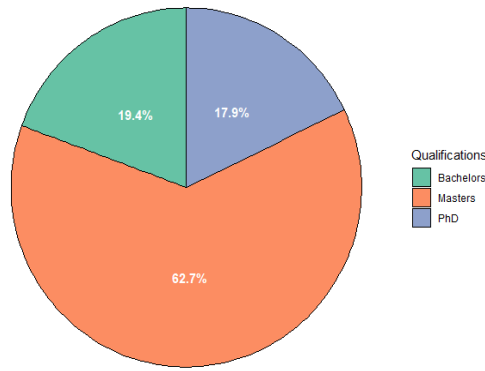
Figure 1: The qualifications of the teaching staff

Eighty-three-point one per cent of the final year students are offering bachelor's degree courses, 16.9% offer master's courses, and no student is undertaking a PhD course, as shown in Figure 2.
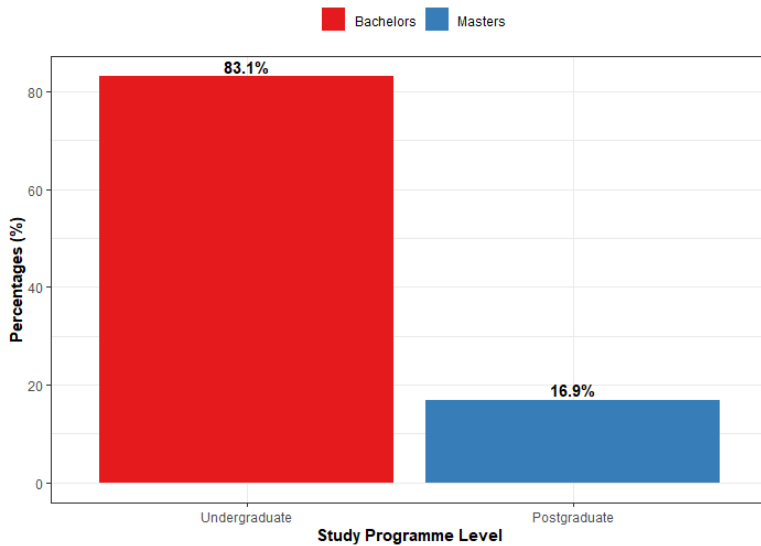
Figure 2: The students' study programme levels

Thirty-three point nine per cent of the final year students are offering a Bachelor of Nursing Science and Midwifery, 29.9% offer a Bachelor of Science with Education, 7.3% offer Masters of Public Health, 6.8% offer a Bachelor of Public Health, 6.2% offer Masters in Public Administration and Management, 5.6% offering Bachelor of Information Systems, 4.0% offering Executive Masters of Business Administration, 2.8% offering Bachelor of Business Administration, 1.7% offering Bachelor of Science in Information Technology, 1.1% offering Bachelor of Commerce, and 0.6% are offering Bachelor of Information Technology, as shown in Figure 3.

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Figure 3: The names of programmes offered by the final-year students

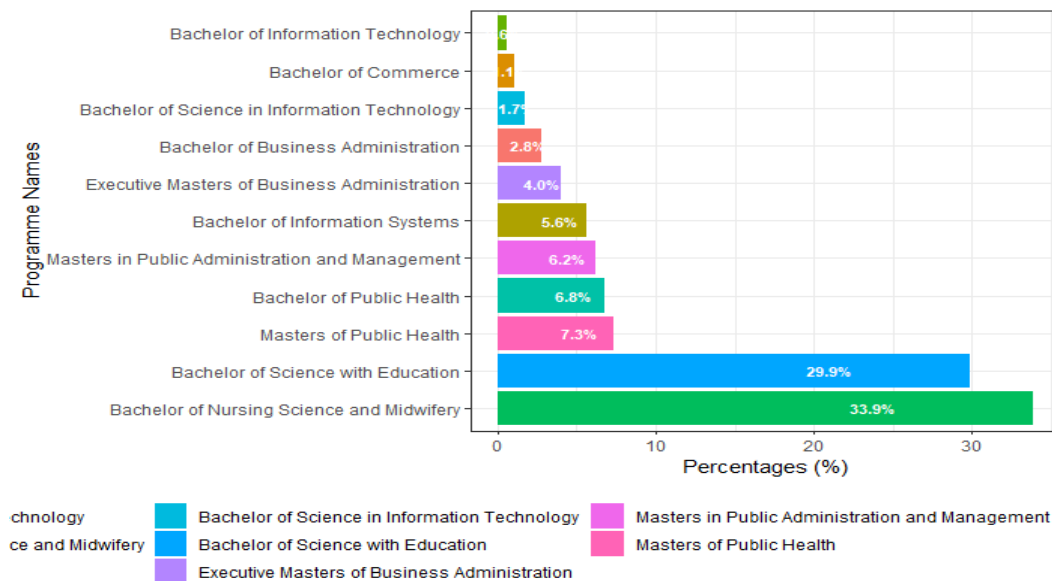## 4.1.3 Respondents' opinion about types of EIRs available to academic library users of Muni and Lira Universities

The results in Table 2 indicate that all EIRs are accessed and used by Muni and Lira University library users. The most frequently used EIRs in the academic libraries of the two universities are e-books (99.2%), e-journals (98.8%), e-Theses/Dissertations (94.7%), e-Standards (94.3%), Internet Services (93.4%), e-Reports (92.2%), e-Databases (87.7%), and Institutional Repositories (85.7%). At the same time, e-Newspapers (36.1%) and CD-ROM (15.6%) are the least-used EIRs in the academic libraries of Muni and Lira Universities.

Table 2: Respondents' opinion on frequently used EIRS in academic libraries of Muni and Lira universities

No	Available EIRS in Academic Libraries	Yes	No
1	e-Books	242(99.2)	2(0.8)
2	e-Journals	241(98.8)	3(1.2)
3	e-Theses/Dissertations	231(94.7)	13(5.3)
4	e-Standards	230(94.3)	14(5.7)
5	Internet Services	228(93.4)	16(6.6)
6	e-Reports	225(92.2)	19(7.8)
7	e-Databases	214(87.7)	30(12.3)
8	Institutional Repositories	209(85.7)	35(14.3)
9	Library Websites	165(67.6)	79(32.4)
10	e-Newspapers	88(36.1)	156(63.9)
11	CD-ROM	38(15.6)	206(84.4)

4.1.4 Respondents' opinion about the purpose of using the EIRs

Table 3 shows that 237(97.1%) respondents use EIRs for academic purposes, i.e., doing research and assignments, compiling teaching and learning materials, and preparing seminar presentations. This is followed by 231(94.7%) of the participants who used it for acquiring development ideas, 225(92.2%) to improve their knowledge, 216(88.5%) for efficient retrieval of information, 205(84.0%) for career development, 189(77.5%) for curriculum design and development, 183(75.0%) to communicate and collaborate with friends and classmates, 178(73.0%) for online registration, 175(71.7%) for recreational purposes, and 170(9.7%) to read current news.

Table 3: Respondents' opinions on the reasons for using EIRs

No	Reasons for using EIRs by Academic Library Users	Frequency	Percentage
1	For academic purposes such as doing research and assignments, compiling teaching and learning materials, and preparing seminar presentations	237	97.1%
2	For acquiring development ideas.	231	94.7%
3	To improve knowledge.	225	92.2%
4	For efficient retrieval of information.	216	88.5%
5	For career development	205	84.0%
6	For curriculum design and development.	189	77.5%
7	To communicate and collaborate with friends and classmates.	183	75.0%
8	For online registration.	178	73.0%
9	For recreational purposes	175	71.7%
10	To read current news.	170	69.7%

4.2 Awareness and drivers for the usage of EIRs in academic libraries

One of the objectives of this study is to establish respondents' perceptions regarding their awareness and drivers for using EIRs in academic libraries. A five-point Likert scale was used to ascertain the respondents' opinions. Mean and standard deviations were computed to assist the research conclusion.

4.2.1 Respondents' exposure to all the library EIRs by librarians

The study establishes the respondents' opinions regarding their exposure to all the library EIRs by the librarians. Decisions were made based on the percentages, mean, and standard deviations calculated. Table 4 shows the respondents' opinions regarding their exposure to all the library EIRs by the librarians.

Table 4: Opinion of respondents regarding their exposure to all the library EIRs by librarians

No.	Statement	SD	D	N	A	SA	M	SD
1	Librarians expose library users to all the library EIRs.	4.9	4.9	7.8	51.6	30.7	**3.98**	**1.014**

SD=Strongly Disagree, **D**=Disagree, **N**=Neutral, **A**=Agree, **SA**=Strongly Agree, **M**=Mean, and **SD**=Standard Deviation.

From Table 4, most respondents (51.6%) agreed that librarians expose library users to all the library EIRs ($M = 3.98$, $SD = 1.014$). Therefore, it was statistically significant to conclude that librarians expose library users to all the library EIRs because the mean is more significant than 3.41.

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4.2.2 Respondents' opinion about the importance of accessing EIRs

The study establishes the respondents' opinions regarding the importance of accessing EIRs. The percentages, mean, and standard deviations were calculated to assist in decision-making decisions. Table 4 represents the participants' opinions regarding the importance of accessing EIRs.

Table 4: Opinion of respondents regarding the importance of accessing EIRs

No.	Statement	NI	SI	MI	I	VI	M	SD
1	It is essential to access EIRs.	0.4	3.7	5.3	27.5	63.1	**4.49**	**.793**

NI=Not Importance, **SI**=Slightly Importance, **MI**=Moderately Importance, **I**=Importance, **VI**=Very Importance, **M**=Mean, and **SD**=Standard Deviation

The majority of the respondents (63.1%) agreed that it is important to access EIRs ($M = 4.49$, $SD = .793$). Therefore, the conclusion that it is important to access EIRs was statistically significant because the mean is greater than 3.41.

4.2.3 Respondents' opinions on the drivers for using EIRs in academic libraries

One of the objectives of this study is to establish respondents' perceptions regarding the drivers for using EIRs in academic libraries. Figure 4 summarises the critical drivers for using EIRs in academic libraries.
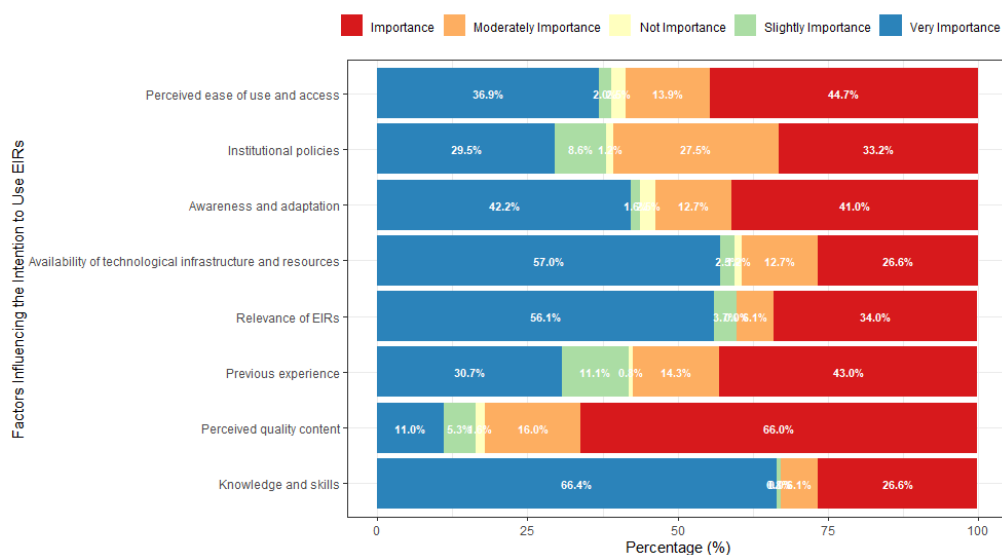

Figure 4: The drivers for the usage of EIRs in academic libraries

4.3 SWOT analysis of EIRs usage in Ugandan academic libraries

This study mainly focuses on the SWOT analysis of EIR usage in Ugandan academic libraries. It is used to analyse the internal factors (strengths and weaknesses) and external factors (opportunities and threats) affecting EIR usage in Ugandan academic libraries to help the university make a feasible decision.

The respondents' perceptions regarding the SWOT to EIRs usage in Ugandan academic libraries were examined. A five-point Likert scale was used to ascertain the respondents' opinions about the SWOT analysis of EIR usage in Ugandan academic libraries. Mean and standard deviation values were calculated to assist the researchers in concluding in this respect.

4.3.1 Strengths of EIRs usage in Ugandan academic libraries

Table 6: Opinion of respondents regarding strengths of EIRs use in Ugandan academic libraries

No.	Strengths of EIRs	SD	D	N	A	SA	M	SD
1	Availability of skilled personnel (Faculty members).	0.8	2.5	9.0	36.9	50.8	**4.34**	**.809**
2	EIRs are portable.	1.2	4.9	7.4	36.1	50.4	**4.30**	**.895**
3	Meaningful use of study material.	0.4	2.9	8.6	47.1	41.0	**4.25**	**.765**
4	Staff, Students', and librarians' willingness to learn	1.2	3.3	11.9	38.9	44.7	**4.23**	**.872**
5	Multidisciplinary sources of information.	1.2	2.9	13.1	41.4	41.4	**4.19**	**.859**
6	EIRs are current, authentic, and trusted sources of information.	2.0	4.9	12.7	34.0	46.3	**4.18**	**.972**
7	EIR platforms are user-friendly.	1.6	4.1	13.1	43.9	37.3	**4.11**	**.898**
8	Staff, Students, and librarians are computer literate.	2.0	4.9	12.3	41.0	39.8	**4.11**	**.945**
9	Availability of Remote Access to EIRs.	2.9	6.1	16.4	31.1	43.4	**4.06**	**1.050**
10	Multiple access to a single resource	1.2	4.5	21.3	34.8	38.1	**4.04**	**.942**
11	EIRs are easy to use and facilitate interactivity.	1.2	7.4	13.9	41.8	35.7	**4.03**	**.951**
12	EIRs are available anytime and anywhere.	4.1	12.3	8.6	35.2	39.8	**3.94**	**1.160**
13	It makes it easy to interact with librarians online.	2.5	9.4	17.6	36.1	34.4	**3.91**	**1.056**
14	University readiness to fund and support EIRs	4.9	7.8	20.1	36.5	30.7	**3.80**	**1.108**

SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree, M=Mean, and SD=Standard Deviation.

As for the opinion of the respondents regarding the strengths of EIRs usage in Ugandan academic libraries, the majority of them rated, availability of skilled personnel (*M* = 4.34, *SD* = .809), EIRs are portable (*M* = 4.30, *SD* =.895), meaningful use of study material (*M* = 4.25, *SD* =.765), staff, students' and librarians' willingness to learn (*M* = 4.23, *SD* =.872), multidisciplinary sources of information (*M* = 4.19, *SD* =.859), EIRs are current, authentic and trusted sources of information (*M* = 4.18, *SD* =.972), EIRs platforms are user-friendly (*M* = 4.11, *SD* =.898), staff, students and librarians are computer literate (*M* = 4.11, *SD* =.945), availability of remote access to EIRs (*M* = 4.06, *SD* = 1.050), multiple access to a single resource (*M* = 4.04, *SD* =.942), EIRs are easy to use and facilitate interactivity (*M* = 4.03, *SD* =.951), EIRs are available anytime and anywhere (*M* = 3.94, *SD* = 1.160), it makes it easy to interact with librarians online (*M* = 3.91, *SD* = 1.056), and university readiness to fund and support EIRs (*M* = 3.80, *SD* = 1.108) high. Therefore, it was statistically significant to conclude that those mentioned above are the strengths of EIR usage in Ugandan academic libraries because their means are greater than 3.41.

4.3.2 Weaknesses of EIRs usage in Ugandan academic libraries

Table 7: Opinion of respondents regarding weaknesses of EIRs use in Ugandan academic libraries

No.	Weaknesses of EIRs	SD	D	N	A	SA	M	SD
1	The absence of local content.	2.5	10.7	11.1	27.0	48.8	**4.09**	**1.115**
2	Low bandwidth and unstable Internet	1.6	2.0	5.7	27.0	63.5	**4.49**	**.829**
3	Dependent on Internet connectivity.	1.2	7.8	9.0	21.7	60.2	**4.32**	**1.008**
4	The workload at the workplace for faculty members limits their time to search, retrieve and evaluate EIRs for teaching and learning.	0.4	6.1	17.2	34.4	41.8	**4.11**	**.930**

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No.	Weaknesses of EIRs	SD	D	N	A	SA	M	SD
5	Negative attitudes of some faculty members and students towards new technology and reading nonprint resources	2.9	10.2	13.5	35.7	37.7	**3.95**	**1.088**
6	The resistance of some lecturers to adopt change and new technology	2.5	12.3	14.3	36.5	34.4	**3.88**	**1.092**
7	There are too many password requirements to access the resources	3.7	11.9	17.6	30.7	36.1	**3.84**	**1.150**
8	Lack of commitment among faculty members to use EIRs.	5.7	12.7	16.4	31.6	33.6	**3.75**	**1.211**
9	Difficulty in searching and accessing electronic resources from publishers' portals	2.9	13.9	17.2	36.9	29.1	**3.75**	**1.106**
10	Limited support for faculty members on the use of EIRs	2.9	11.5	20.9	37.7	27.0	**3.75**	**1.066**
11	Limited competencies of faculty members on the use of EIRs	5.3	14.8	13.9	36.5	29.5	**3.70**	**1.192**
12	Lack of computing devices for accessing the resources.	5.3	18.9	14.8	23.8	37.3	**3.69**	**1.290**
13	Lack of institutional support.	3.7	17.2	20.5	23.8	34.8	**3.69**	**1.218**

SD=Strongly Disagree, **D**=Disagree, **N**=Neutral, **A**=Agree, **SA**=Strongly Agree, **M**=Mean, **SD**=Standard Deviation.

About the opinion of the respondents regarding the weaknesses of EIRs usage in Ugandan academic libraries, the majority of them rated the absence of local content ($M = 4.09$, $SD = 1.115$), low bandwidth and unstable Internet ($M = 4.49$, $SD = .829$), dependent on Internet connectivity ($M = 4.32$, $SD = 1.008$), the heavy workload at the workplace for faculty members limits their time to search, retrieve and evaluate EIRs to be used for teaching and learning ($M = 4.11$, $SD = .930$), negative attitudes of some faculty members and students towards new technology and reading nonprint resources ($M = 3.95$, $SD = 1.088$), the resistance of some lecturers to adopt change and new technology ($M = 3.88$, $SD = 1.092$), too many password requirements to access the resources ($M = 3.84$, $SD = 1.150$), lack of commitment among faculty members to use EIRs ($M = 3.75$, $SD = 1.211$), difficulty to search and access electronic resources from publishers' portals ($M = 3.75$, $SD = 1.106$), limited support for faculty members on the use of EIRs ($M = 3.75$, $SD = 1.066$), limited competencies of faculty members on the use of EIRs ($M = 3.70$, $SD = 1.192$), lack of computing devices for accessing the resources ($M = 3.69$, $SD = 1.290$), and lack of institutional support ($M = 3.69$, $SD = 1.218$) high. Therefore, it was statistically significant to conclude that those mentioned above are the weaknesses of EIR's use in Ugandan academic libraries because their means are greater than 3.41.

4.3.3 Opportunities in the usage of EIRs in Ugandan academic libraries

Table 8: Respondents' opinions regarding opportunities for using EIRs in Ugandan academic libraries

No.	Opportunities for the use of EIRS	SD	D	N	A	SA	M	SD
1	The adoption of ODEL in academic institutions due to COVID.	4.5	3.3	13.1	31.6	47.5	**4.14**	**1.062**
2	The availability of multidisciplinary journals increases access to a variety of EIRs.	3.3	4.1	14.8	33.6	44.3	**4.11**	**1.020**
3	User-friendliness of EIR's search engines	1.2	5.7	18.9	37.3	36.9	**4.03**	**.949**

No.	Opportunities for the use of EIRS	SD	D	N	A	SA	M	SD
4	Expansion of Internet connectivity programmes by governments and the private sector	5.3	6.1	15.2	27.9	45.5	**4.02**	**1.156**

SD=Strongly Disagree, **D**=Disagree, **N**=Neutral, **A**=Agree, **SA**=Strongly Agree, **M**=Mean, **SD**=Standard Deviation.

On the opinion of the respondents regarding opportunities for the usage of EIRs in Ugandan academic libraries, the majority of them rated the adoption of ODEL in educational institutions due to COVID (M = 4.14, SD = 1.062), the availability of multidisciplinary journals increases access to a variety of EIRs (M = 4.11, SD = 1.020), user-friendliness of EIRs search engines (M = 4.03, SD =.949), and expansion of Internet connectivity programmes by governments and the private sector (M = 4.02, SD = 1.156) high. Therefore, it was statistically significant to conclude that those mentioned above are the opportunities for using EIRs in Ugandan academic libraries because their means are greater than 3.41.

4.3.4 Threats to the usage of EIRs in Ugandan academic libraries

Table 9: Opinion of respondents regarding threats to the use of EIRs in Ugandan academic libraries

No.	Threats to the use of EIRs	SD	D	N	A	SA	M	SD
1	Unreliable Internet connectivity and shut down by the government.	0.4	0.8	4.1	27.9	66.8	**4.60**	**.650**
2	Unreliable power supply.	3.3	5.3	8.6	25.8	57.0	**4.28**	**1.044**
3	Ever-increasing subscription fees for the EIRs.	4.9	7.0	16.0	22.5	49.6	**4.05**	**1.175**
4	Unfriendly intellectual property rights (copyright issues)	1.6	7.4	22.1	28.7	40.2	**3.98**	**1.034**
5	Ever-increasing cyber-attacks and other online securities issues (Theft of personal data).	4.1	7.4	18.9	30.3	39.3	**3.98**	**1.117**
6	Dwindling Donor funds towards payments of EIRs	1.2	6.6	25.8	29.1	37.3	**3.95**	**1.003**
7	Unfavourable changes in use agreement terms by publishers and aggregators.	1.6	6.6	25.4	32.8	33.6	**3.90**	**.997**
8	Limited publicity for the EIRs.	3.7	15.6	20.9	25.0	34.8	**3.72**	**1.199**

SD=Strongly Disagree, **D**=Disagree, **N**=Neutral, **A**=Agree, **SA**=Strongly Agree, **M**=Mean, **SD**=Standard Deviation.

The majority of the respondents rated the threats in Table 9 high and agreed that unreliable Internet connectivity and shutdown by the government (M = 4.60, SD =.650), unreliable power supply (M = 4.28, SD = 1.044), ever-increasing subscription fees for the EIRs (M = 4.05, SD = 1.175), unfriendly intellectual property rights (copyright issues) (M = 3.98, SD = 1.034), ever-increasing cyber-attacks and other online securities issues (M = 3.98, SD = 1.117), dwindling donor funds towards payments of EIRs (M = 3.95, SD = 1.003), unfavourable changes in use agreement terms by publishers and aggregators (M = 3.90, SD =.997), and limited publicity for the EIRs (M = 3.72, SD = 1.199), were the threats to the use of EIRs in Ugandan academic libraries. Therefore, it was statistically significant to conclude that those mentioned above are the threats to using EIRs in Ugandan academic libraries because their means are greater than 3.41.

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5 Discussion

The low usage statistics of EIRs in Ugandan academic libraries are a big concern for librarians; hence, this study is needed in Uganda and semi-urban academic libraries. The findings of this study generated ideas that libraries and library consortia can use in decision-making regarding choices of EIRs selection and their procurement of EIRs to realise value for money better. The study answered these essential questions in understanding ways of improving the usage of EIRs in northern Ugandan academic libraries. (1) What is the level of awareness of the teaching staff and final year students on the current EIRs at their academic library(ies)? (2) What factors influence teaching staff' and final-year students' intention to use EIRs? (3) What are the strengths, weaknesses, opportunities and threats of using EIRs in Ugandan academic libraries?

Awareness of EIRs is a facilitator for using these resources in the library; the findings from this study suggest that the users of electronic resources at Muni and Lira Universities are aware of the various EIRs provided to them. This outcome is consistent with the studies conducted by (Yebowaah, 2017; Ahmed & Al-Reyaee, 2017 Adeleke & Nwalo 2017; Chepukaka, 2017 Leonard et al., 2020), who noted that teaching staff were aware of the e-resources, although the usage of these resources remained low. However, this observation contradicts a similar study by Gakibayo et al. (2013), which found low use of EIRs due to a lack of awareness. Gakibayo et al. (2013) and Bwalya and Ssebbale (2017) recommended that librarians effectively market their EIRs to know the resources for effective and efficient usage. The respondents of this study think that the librarians at the two universities effectively did their role of awareness creation service. Now, with some of the restrictions on physical access to libraries and librarians due to COVID-19, librarians should not relax their role of marketing EIRs. This is done online through webinars, and the recordings are uploaded to YouTube, with links shared on library social media platforms such as Facebook pages, Twitter accounts, and WhatsApp groups. Based on the vital role of EIRs in teaching, learning and research, the study participants agreed that EIRs are essential in the conduct of their businesses.

Several drivers for using EIRs in academic libraries in Uganda, such as knowledge and skills, were identified. This is in line with the submission of scholars (Ehioghae et al., 2020; Leonard et al., 2020; Gautam & Sinha, 2020; Hendal, 2020), who found that to effectively use EIRs for teaching, learning and carrying out research, one must possess a set of skills for defining the problem at hand, searching, identifying, and evaluating the right source of information, retrieving accurate, relevant, and recently published information; Relevance of EIRs. This finding conforms with what some scholars (Babarinde & Onifade, 2019; Machimbidza & Mutula, 2020) found: the availability of technological infrastructure and resources like the Internet and computers. This finding is reported in another earlier study conducted by (Tlakula & Fombad, 2017), who believed that a successful implementation of EIRs requires putting in place technological infrastructures such as intranet and Internet connectivity which is good and fast and having computing hardware and software, awareness and adaptation. This finding is similar to the studies of (Chepukaka, 2017; Leonard et al., 2020), where it was found that teaching staff were aware of the e-resources. Perceived ease of use and access. This result is logical to the work conducted by some scholars (Chepukaka, 2017; Leonard & Snyman, 2019), where it was observed that EIRs are easier to use once the library users know where to access these resources and institutional policies. Chepukaka (2017) also affirmed that it was noted that developing institutional policies that support and promote the usage of electronic resources to develop teaching and learning materials and support decision-making and development of institutional operational documents such as guidelines. Other factors identified included perceived quality content and previous experience.

The strengths of EIR usage in Ugandan academic libraries identified include the availability of skilled personnel. This outcome is consistent with the studies conducted by some scholars (Chepukaka, 2017; Mbambo-That, 2020), where it was found that contemporary libraries support their stakeholders by having access to their electronic library resources and services remotely without being in a library building through the use of virtual private network (VPN) software such as RemoteXs and EZproxy access platforms

that make the library resources accessible outside the institution Public Internet (IP) coverage; EIRs are portable, and one can carry thousands of them in a pocket when saved in a drive. This was noted in previous studies by (Leonard & Snyman, 2019). Portability makes EIRs user-friendly because they are easy for learners to carry. They are portable and easy to use and facilitate interactivity (Darandale, 2017), meaning the user can easily copy and paste content or print a portion of information from the eCopy; EIRs are current, authentic and trusted sources of information. This was confirmed by (Makozho, 2020), who asserted that EIRs are regularly published and undergo a thorough peer review, making them authentic and trusted sources of information for decision-making and supporting teaching and learning. These resources are more beneficial to the teaching staff in updating their teaching materials and solving the "yellow notes" problem of repeating outdated references (Chepukaka, 2017); staff, students, and librarians are computer literate. This finding is similar to the studies of (Ehioghae et al., 2020), where it was found that the majority of contemporary academics are computer-competent and frequently use them for their daily work.

Furthermore, ICT skills are essential enablers of using EIRs in an institution (Leonard et al., 2020); EIRs are available anytime and anywhere for library users, making them a better choice. This was confirmed by several previous studies (Tlakula & Fombad, 2017; Leonard & Snyman, 2019; Babarinde & Onifade, 2019; Leonard et al., 2020), who noted that the Internet made it easier for learners, researchers and teachers to access information to solve their problems anytime and in any location without physical movements to a library. This is further simplified by publishers' wide online publication of information materials such as eJournals and eBooks that address the diverse needs of contemporary learners who prefer the learning experience's convenience; the availability of platforms allows access to EIRs remotely without being at campus (within public IP ranges). This makes access to library resources within the library walls and off-site (outside the institution) (Yang, 2012). This improves efficiency in service provision by librarians because the library resources can be accessed anywhere and anytime (Leonard et al., 2020); users' multiple access to a single resource makes EIRs more popular than print resources held in libraries (Leonard & Snyman, 2019). Access to one electronic resource by more than one user benefits libraries with limited budgets for procuring enough print resources to equally serve all library users' information needs (Darandale, 2017); EIRs make it easy to interact with librarians online. It is also confirmed by other researchers such as (Yang, 2012), where it was identified that digital libraries promote quicker user interaction with librarians that promote information sharing both on-site and off-site. University readiness to fund and support EIRs: This sentiment by the respondents was voiced in a previous study by (Chepukaka, 2017), who intimated those institutions with good policies for funding and building ICT infrastructures tend to benefit a lot from digital transformation initiatives such as adopting EIRs in support of research, and teaching and learning. Some of the strengths of EIRs found include meaningful use of study material; staff, students and librarians' willingness to learn; multidisciplinary sources of information; EIRs platforms are user-friendly; and EIRs are easy to use and facilitate interactivity.

Some weaknesses identified in using EIRs in Ugandan academic libraries include lacking local content. Numerous studies (Tlakula & Fombad, 2017; Darandale, 2017) noted that most EIRs are not in local languages or have published indigenous research, making some content not fit the local context. This makes their usage and application unprioritised; EIRs depend on Internet connectivity for their access, which has been reported to be slow and unreliable. This finding confirms what was reported in a previous study (Tlakula & Fombad, 2017; Leonard & & Snyman, 2019; Makozho, 2020), which asserted that electronic resources are published in different places or countries and hosted on servers far from each other. Therefore, accessing such resources requires stable and reliable access to the Internet. Internet connectivity in Uganda is slow, particularly in rural and urban parts of Uganda (Gakibayo et al., 2013). This could be attributed to the low usage of digital initiatives in Higher Education (Ali et al., 2019), lack of computer literacy skills and computing devices for accessing the resources and appropriate software coupled with a lack of commitment among teaching staff to use and encourage their student to use EIR for learning was reported as a limitation

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in the usage of EIRs in northern Uganda. This finding was reported in similar studies by (Tlakula & Fombad, 2017; Sohail & Ahmad, 2017; Mollel & Mwantimwa, 2019; Machimbidza & Mutula, 2020; Liasu & Bakrin, 2022). Skills and possession of the ICT equipment with the necessary installed software play a critical role in using EIRs in rural institutions where other alternatives are hard to find. Some institutions in Uganda, such as Muni University, instituted policies requesting their newly admitted students to bring their own devices (BYOD) for teaching and learning. However, implementing the policy is ineffective (Buruga, 2016); some learners do not possess the devices. Relatedly, the negative attitude towards using EIRs also affects the usage of these resources; the multiple login password requirements to access the resources discourage using EIRs by those who might not have forgotten their login passwords. This problem is real at Muni University, where library users must have a username and password for the library catalogue, another for accessing EIRs and the eLearning system, and student registration. Bwalya and Ssebbale (2017) noted the challenge. They suggested that libraries acquire a system to integrate all university login-related accounts so that users will use one username and password to access all library systems. Some of the identified weaknesses included a lack of computing devices to access the resources, lack of commitment among faculty members to using EIRs, limited competencies of faculty members in using EIRs, the resistance of some lecturers to adopt change and new technology, limited support for faculty members on using EIRs, lack of institutional support, negative attitudes of some faculty members and students towards new technology and reading nonprint resources, and the heavy workload at the workplace for faculty members limiting their time to search, retrieve and evaluate EIRs.

Several opportunities have been identified to increase the usage of EIRs in Ugandan academic libraries, including adopting ODEL in academic institutions due to the COVID-19 pandemic. Some scholars (Mbambo-That, 2020; Tsekea & Chigwada, 2021) believe that COVID-19 brings an opportunity for libraries to effectively promote the use of EIRs as a remedy to reduce physical contact with print materials and with librarians. Such new normal ideas have been innovated and adopted by institutions to provide services to their clients. Muni University developed an ODEL policy to guide and promote online learning. One of the policy objectives is to acquire quality EIRs to support research, teaching, and learning at the university; the availability of multidisciplinary journals increases access to various EIRs. Contemporary research focuses on multidisciplinary research where different knowledge domains work together to benefit from each other's uniqueness, which promotes the EIRs that Ugandan libraries possess. A study by Darandale (2017) hinted that major journals promote multidisciplinary research to add value to their research products and increase their impact factor from knowledge domains. The government of Uganda's Internet connectivity expansion programmes offer an excellent opportunity for library users to have cheaper alternative means to access the Internet. Northern Uganda is now connected to the National Backbone Infrastructure Project (NBI/EGI) (NITA-U, 2021). This government Internet service will back up what is already provided by the private sector. The Internet bandwidth prices are also reducing yearly due to the competition by the many players due to the liberalised telecommunication sector in Uganda (Ali et al., 2019), and the rapid development in ICT has made publishers develop systems that made EIRs access platforms easy to use by simpler search engines accessible by mobile devices of any kind. Some even developed mobile applications that allow users to download their content on mobile devices and access it offline. This is beneficial to users of EIRs that have limited access to the Internet.

Threats to the usage of EIRs in Ugandan academic libraries include slow and unreliable Internet connectivity, which affects EIR usage in the rural parts of developing countries such as Uganda. As noted by some scholars (Gakibayo et al., 2013; Chepukaka, 2017; Buruga & Osamai, 2019; Ali et al., 2019; Azonobi et al., 2020; Makozho, 2020; Liasu & Bakrin, 2022), access to EIRs requires stable and speedy Internet access. Unfortunately, such Internet connectivity can hardly be found in rural Uganda. The available Internet is slow and sometimes inaccessible. This is a big stabling block in the usage of EIRs; as such, library users are forced to use the available option, the print library collections.

Unreliable electricity supply is a threat to the access of EIRs. This respondents' view was expressed in the studies (Darandale, 2017; Leonard et al., 2020; Liasu & Bakrin, 2022), which indicated that access to EIRs depends on electricity for powering the devices needed to access and use the resources. A similar study conducted in Zimbabwe (Makozho, 2020) noted that unreliable electricity supply made access points for the EIRs, such as websites and servers, off most of the time, hence limiting the usage of the EIRs; the subscription fees for EIRs keep increasing every year even though the usage statistics in most developing countries continue to remain low. Because of the increases in subscription fees, some libraries are forced to reduce EIRs subscribed to work within the limited budget. However, as (Hendal, 2020) noted, a reduction in EIRs databases subscribed reduces the amount of library users' information resources for their academic work and unfriendly intellectual property rights (copyright issues) restrictions. This observation was made by (Yang, 2012), who asserted that access to most electronic resources is limited by copyright law and regulations. Some of these laws restrict copying text and printing limited pages of a document, thus affecting the usage of EIRs. Some of these unfavourable regulations are witnessed by eBooks database providers where download/print of book pages are changed anytime by publishers/aggregators without notifying libraries; ever-increasing cyber-attacks and other online security issues, e.g., theft of personal data. Another earlier study also reported this finding (Yang, 2012). They opined that there are safety questions about network securities and using personal data collected by EIRs platforms and publishers. Likewise, some library resources are not easily accessible because the websites hosting the EIRs' links are not well organised, and others are often off when needed (Makozho, 2020).

Dwindling donor funds towards payments of EIRs for library consortiums like CUUL has affected their capacity to subscribe to enough EIRs for their library users. For example, the CUUL member libraries used to benefit from resources such as the Institute of Electrical and Electronics Engineers (IEEE) eLibrary, Sage, American Society of Civil Engineering, Wiley, Project Muse, Cambridge University Press, and Henry Stewart Talks that Makerere University subscribed through their donor Sweden's Government Agency for Development Cooperation (SIDA) project (Okello-Obura & Magara, 2008); limited publicity for the EIRs as one of the weaknesses affecting the usage of EIRs. This was noted in the studies by (Chepukaka, 2017; Mbambo-That, 2020). Mbambo-That (2020) suggested that librarians consider adopting appropriate marketing and promotion options for the library EIRs and creating easy access points for EIRs on library catalogues, websites, and links shared on online platforms such as social media. Difficulty in searching and accessing electronic resources from publishers' portals. This finding is logical with the work (Makozho, 2020; Hendal, 2020), where they found that some EIR platforms are difficult to search and access a resource to download, coupled with the platforms' poor design interfaces, especially those without a search engine. Other threats identified included unfavourable changes in user agreement terms by publishers and aggregators.

6 Conclusions

Many universities in Uganda adopted the EIRs before and during COVID-19 to ease access to library information services and resources. No University in northern Uganda has ever conducted a comprehensive SWOT analysis on EIR usage in academic libraries. This study, therefore, will help universities and other institutions that wish to implement EIR. The analysis of the results confirms that most respondents agreed that librarians expose teaching staff and final-year students to all the library EIRs. It also confirmed that it is essential for teaching staff and final-year students to access EIRs. The study identified knowledge and skills, the relevance of EIRs, awareness and adaptation, availability of technological infrastructure and resources, institutional policies, perceived ease of use and access, perceived quality content, and previous experience as the drivers for the usage of EIRs in academic libraries in Uganda by teaching staff and final year students. Similarly, the strengths, weaknesses, opportunities, and threats to using EIRs were identified. This research, thus, recommends that for a fruitful adoption and implementation of EIRs in Ugandan libraries,

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- The government and universities should provide a reliable and alternative power supply, such as solar and power backups, to enable easy EIR access.
- The government and universities should provide reliable and fast Internet connectivity for easy EIR access and increase the Internet bandwidth for academic libraries.
- The universities should train, motivate, and support their library department, librarians, teaching staff, and students to ensure maximum use of EIRs.
- Academic libraries must purchase more computing devices like computers, laptops, and Kindle to access the EIRs.
- The government and academic libraries should adequately account for and use donor funds for EIR payments.
- EIR publishers should improve EIR's platform design interfaces to search for information and access available electronic resources easily.
- Finally, intellectual property rights should be friendly to the universities.

The findings of this study generated ideas that universities, libraries, and library consortia can use in decision-making regarding EIRs selection and procurement to realise value for money.

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35. Integration of Expert Systems in TVET Libraries Amidst 4IR Era in Kenya

Wilson Kabucho Wambui*; Ben Wekalao Namande**

Nyandarua National Polytechnic, Kenya
wilsonkabucho@gmail.com

**Kisii University, Kenya*
wekanamande@gmail.com

Abstract

The fourth Industrial Revolution era has undoubtedly driven change in the Digital world. The digital era provides libraries with an opportunity to reprofile their competencies and reinvent themselves in order to remain relevant in the dissemination of information. The research sought to investigate the integration of expert systems in technical and vocational training institutions in Kenya to promote the shaping of digitalisation during the fourth industrial revolution. The research design adopted was descriptive. The target population was small. Therefore, a census of 48% of respondents was done. The questionnaire was tested for validity and reliability. The items were reliable, with a Cronbach alpha score of 0.7853 exceeding 0.7. the researcher did content and face validity. Data was quantitatively analysed and presented in the form of tables and charts. In conclusion, it was established that 98% of the TVET Libraries in the Mt Kenya region have not integrated the Expert systems. The low integration was attributed to a lack of Qualified and techno-serving librarians and few or no modern libraries. The study recommended that to increase expert system integration in TVET libraries; libraries should Construct modern libraries, employ more qualified and techno-serving librarians and encourage the Integration of Expert Systems in TVET libraries in Kenya.

Keywords: *Expert system, 4IR, access to information, TVET libraries, library service*

1 Introduction

Expert systems (ESs) are computer-based systems that simulate human decision-making. They can integrate with information systems to improve accuracy and performance (Jacknis, N. (2017). These systems are controlled electronically with the computer's aid, mimicking the human mind's competencies. Expert systems keep records and analyse every action being made by the user. As a result of innovation in science and technology, Expert Systems are used in all facets of life for human development and comfort. ESs help users obtain answers to simple reference questions. They must prove their unparalleled value and expertise and identify opportunities to attract and engage new patrons with high digital fluency through advanced services and user experiences. The adoption of (ESs) in the library will influence the connectivity of information technology and actively support information usage in 4IR, ease clients' search and immediately address their needs. The impact of expert systems and advanced computer technology on the nature of future libraries will be enormous, and the quality difference will vary among experts. (Asemi & Nowkarizi, 2020).

In Kenya, the TVET librarians have seen Expert Systems as a new driving force for developing intelligent libraries in the 4IR era. In order to meet the current global trends in librarianship, librarians have begun to incorporate artificial technologies in the library system to meet the current trends in the country. Despite their efforts to meet the current trends, there is little or no documentation on incorporating Expert systems in TVET libraries. There is a need for a document that will expose the integration of expert systems in TVET libraries in Kenya. This necessitated the embarking of this study. Therefore, in order to achieve the aim of this study. The research objective was to reveal the Integration of Expert systems in TVET libraries; as stated above, this research aims to inform the audience about the integration of Expert systems in TVET libraries in Kenya.

This study adopted the qualitative research method and an expository approach. Information was sourced from online search engines, articles, journals, and international publications. The prevailing understanding

of technology as merely instrumental (the "man versus machine" dichotomy) can prove inadequate for analysing the complex and multiple aspects of AI interaction.

2 Statement of the problem

Library users in TVET libraries in Kenya have been experiencing a challenge in accessing information materials such as books and Past papers remotely in this era of the fourth industrial revolution due to the information explosion and lack of library automation. Most of the TVET Institutions' libraries have not embraced the integration of expert systems in making the information materials and past papers easily accessible, thus making library users unable to access information materials remotely to contribute to the shaping of digitalisation in the fourth industrial revolution in society.

The findings of this study will impart knowledge to TVET libraries in Kenya on the importance of integrating expert systems to enable library users to access information materials remotely using communication gadgets such as mobile phones in the comfort of their living rooms, thereby shaping digitalisation in the 4IR era.

The study results will reconcile theory to reality, and its findings will be used for further studies in expert systems. The TVET libraries may use the findings to enhance their housekeeping functions and improve their institutional performance. The study will also contribute to a policy whereby TVET institutions in the Ministry of Education will use the findings of this study to amend government policy to enable technical and vocational institutions to offer quality information materials.

According to the database of the Directorate of Technical Education (DTE) in the State Department of Vocational and Technical Training in Kenya, there were 186 technical and TVET institutions. Technical institutions are grouped per region: Nairobi, Coast, Western, Mt Kenya, Rift Valley, and North Eastern. Among the 186 technical institutions, only 100 of them had libraries by February 2020 (Appendix III & IV). The study focused only on those TVET institutions that had established libraries by February 2021. Further, the study focused

on 28 institutions found in the Mt. Kenya region. Mt. Kenya Region comprises the technical institutions in the following counties: Nyandarua, Laikipia, Nyeri, Muranga, Kirinyaga, Embu, Meru and Tharaka Nithi. The region was selected because of its high number of TVET institutions compared to other regions. The study involved the librarians and trainees between March and September 2021.

In the beginning, respondents feared participating in the study because they feared disclosure of information. However, the researcher assured them of the information's confidentiality and purpose, which was to be used only for academic purposes. Due to the expansive area of the study, time and cost were limited.

2 Literature review

Librarians have acquired many skills to organise information and make it accessible anywhere; libraries can ensure the application of the tools for the new generation of knowledge, which surpasses Google search, which has been developed for academic purposes (Jacknis, 2017). Libraries focus attention on enhancing access to content with the integration of ESs. We have been watching the evidence of this transformation toward integrating ESs. with many libraries initiating and providing Maker space competencies (Kristin, 2016). According to Liu (2011), ESs and librarians needed to reinforce each other to provide the best service to patrons. Microforms were once seen as revolutionary in the 1980s, nearly twenty years after libraries began purchasing them earnestly. The web environment, advancement in technology, options of sources, formats of information and flow of information significantly impact the role of libraries in promoting the shaping of digitalisation in the fourth industrial revolution. Expert systems have been used

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successfully in economic and industrial sectors, and increasingly, they are being employed in service sectors, including medical health care. Against this background, the library and information services (LIS) sector may also explore the potential of expert systems.

2.1 Expert system

Expert systems (ESs) are computer-based systems that simulate human decision-making. They can integrate with information systems to improve accuracy and performance (Singh et al., 1996). Various librarian ES has been developed. Waters (1986) ES to help users obtain answers to simple reference questions. In general, they ask questions from the user and take the user's answer as input, then explain the rationale for decision results. These systems generally have two main elements: A knowledge base and an inference engine. The knowledge base encompasses all the information needs that human/librarian experts use to make decisions. This information is present in the knowledge base as facts and rules. ESs can make much better decisions than librarian decision-makers because their knowledge base can involve the experiences of a team of the best experts. How librarian experts make decisions is emulated for the design rules of the knowledge base. The rules have two main phases: the "if" and the "then phase." The "if phase" consists of conditions, and the "then phase" consists of results. ESs are distinguished from other computer systems by applying reasoning through the inference engine.

- Expert System: The Expert System is a computerised knowledge system that serves as an interface or gateway for accessing the database and obtaining relevant information. It ranges from simple regulatory systems with flat data to large-scale, integrated development that takes many years to develop. An expert system is a computer program that offers expert advice, decisions or solutions to a particular situation. The expert systems' various components are the knowledge base, inference engine and user interface.

- Natural Language Processing: One of computer science's long-standing goals (CS) goals is to teach computers to understand the language we speak today. Natural language is the ultimate generation of computer language. Artificial intelligence scientists have been able to build a natural language interface using a limited vocabulary and syntax.

- Pattern Recognition: The new and pre-stored stimuli coincide closely in this process. This process takes place continuously throughout the lives of all living beings. Pattern recognition is studied in many areas, including psychology, ethology, cognitive science and informatics. Pattern recognition is based on prior knowledge or data from the patterns. Components for pattern recognition are data collection, pre-processing, selection of characters, selection of models, training and evaluation.

- Machine learning: Arthur Samuel, an American pioneer in computer gaming and artificial intelligence, invented the term 'machine learning' in 1959 and defined it as "it gives the computer the ability to learn without explicit programming".

2.2 Application of expert systems in TVET libraries in Kenya

Below are how expert systems could be applied in TVET libraries in Kenya.

2.2.1 Integration of expert systems in reference services

Reference service is one of the vital services rendered in any library, and the Expert System has to be used to substitute the reference librarian in the following ways:

Research: It is a designed system that supplies clients with recommended sources to look for specific questions. This system teaches reference skills or computerised aids for practising reference librarians and information specialists.

- Online Reference Assistance (ORA): This system is intended to stimulate the services of an academic reference Librarian for questions of low and medium levels by using several technologies.

Examples are video-like databases, computer-assisted instruction modules, and a knowledge-based system. ORA consists of directional transactions like library locations, services, and policies.

- PLEXUS: This is a referral tool used by Libraries. It includes knowledge about the reference process, information retrieval about some subject regions, reference sources, and library users. All the above systems are advisory systems for locating reference sources, books, and factual data.

2.2.2 Application of expert system in cataloguing is known as the oldest library crafts

Recent attempts to automate cataloguing through expert systems have focused on descriptive cataloguing because it is considered rule-based (AACR2). There are two approaches for applying artificial intelligence techniques to cataloguing:

- **Application of expert system in classification -** This is the fundamental activity in knowledge organisation. For this reason, it is prominent in all systems for organising knowledge in libraries and information centres. Integration of Expert Systems in the area of classifications in libraries includes the following:
- **Coal SORT** is a conceptual browser designed as a search or indexing tool. It consists primarily of a frame-based semantic network and the software needed to allow users to display portions of it and move around in the conceptual structure.

2.2.3 Application of expert system in indexing of periodicals

This is another area where expert systems are being developed. Indexing a periodical article involves the identification of concepts and translating these concepts into verbal descriptions by selecting and assigning controlled vocabulary terms that are conceptually equivalent to verbal descriptions. Automating the intellectual aspects of indexing improves the indexing consistency and quality. Very few library users have interacted with knowledge-based systems. Generally, users have had minimal contact with these systems because most of them are not perfect enough to be used by the everyday library patron.

2.2.4 Applications of natural language processing in library activities

When we think of the term NLPL, the first thought one might have is that one should be able to speak or write in a complete sentence and have a machine to process the request and speak. NLPL can be applied to many disciplines. This could be applied to the library and information science field, specifically searching databases such as Online Public Access Catalogues (OPAC).

2.2.5 Application of pattern recognition in library activities

In this era of the InternInternetistribution of information and multimedia computing, new and emerging classes of information systems applications have swept into the lives of office workers. New applications ranging from digital libraries, multimedia systems, geographic information systems and collaborative computing to electronic commerce have created tremendous opportunities for information researchers and practitioners.

3 Methodology

The methodology used in the study approach includes the research design, target population, sample, and sampling procedure. The research design adopted was a quantitative research method, using the expository approach for this study. The research instrument used and how the validity and reliability of the instrument were assessed have been discussed. Finally, the data collection procedure used for data analysis and presentation, as well as ethical considerations, have also been discussed.

The researcher evaluated 20 libraries to determine the prevalence of the application of Calibre artificial intelligence. The sample includes the ten Mt Kenya TVET institutions, a group of the most research-intensive institutions in the country. The Mt Kenya TVET Institutions were selected from the List of

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some TVET institutions in Mt Kenya. Although the initial data collection took place in September 2021, The Integration of Expert Systems is not intended as an exhaustive study on the presence of artificial intelligence in libraries. However, it attempts to show a representative picture of the Integration of ESs in research-focused TVET libraries. Table 1 outlines the TVET Institutions that are part of the sample. The researcher used the searches embedded in the TVET libraries.

County	No of TVET institutions	No of Librarians	Total
Meru	7	2	14
Embu	2	2	4
Nyeri	6	2	12
Laikipia	2	2	4
Nyandarua	4	2	8
Tharaka Nithi	3	2	6
Total	**24**		**48**

According to Mugenda and Mugenda (2008), a sample is a small group or sub-group obtained from the accessible population. This subgroup is carefully selected to represent the population with the relevant characteristics. Various sampling techniques can be used to arrive at a sample. They include simple random sampling, systematic random sampling, multi-stage sampling, stratified sampling technique, and census where the target population is small. This study used census because the target population was small. Therefore, the target population and the study's sample size equal 48.

The researcher contacted the librarians of the participating Technical and Vocational Training Institutes to inform them of the study and to acquire informed consent. The questionnaire was subjected to validity and reliability tests before the actual study. Validity was achieved by experts who read the questionnaire and reported on content, construct, and face validity. Piloting for reliability was done at Rift Valley Institute of Science and Technology, where the sampled respondents highlighted the areas of correction that the researcher had affected. After reliability and validity tests, the researcher delivered the questionnaire to each TVET institute. A drop-and-pick strategy was adopted, where the dropped questionnaires were picked after one week. The researcher personally collected the filled-in questionnaires from the respondents.

The instrument was piloted at the Rift Valley Institute of Science and Technology, and the findings were subjected to reliability and validity tests. Cronbach's alpha coefficients were used to establish the internal consistency of the questionnaire items, and all the items had an alpha score of 0.7853, exceeding the threshold of 0.7. The researcher ascertained the instrument's validity using face and content validity, corrected the questionnaire, and amended the questions that were not easy to understand.

4 Findings

Sixty questionnaires were distributed to 24 library users and 48 to librarians from across TVET institutions in the Mount Kenya Region. Seventy-two questionnaires were administered, and 60 were returned for a response rate of 83%.

Most respondents (80%) stated that there are no standard Libraries in the TVET Institutions due to a lack of adequate funds from the government. Most respondents (98%) stated that TVET libraries have not integrated ESs due to a lack of Internet connections and computers. Most respondents stated that Over 95% of the TVET institutions have no qualified librarians who do not have the required knowledge and skills to integrate ESs.

There are no standard libraries in TVET Institutions in the Mount Kenya Region integrated with ESs, affecting how users search and access information; a natural fit for the library would be to position itself at the forefront

of ESs integration. There is an inadequate number of qualified librarians who can promote the integration of ESs in TVET Institutions, which makes it challenging to Integrate Expert systems in the libraries. Due to minimal budget allocation, TVET libraries are not well funded to facilitate Expert systems integration.

6 Conclusion

In conclusion, TVET institutions lack modern libraries with state-of-the-art technologies. Librarians in TVET institutions have not been well trained and disseminated on integrating expert systems; thus, they still use traditional ways of serving library users. Librarians have not begun integrating ES technology in libraries to meet current global trends and contribute to the digitalisation shaping the fourth industrial revolution in society.

7 Recommendations

Based on the enumerated findings, it is recommended that all the TVET libraries in the country be vital to integrating Expert Systems into their library operational systems.

- Modern libraries should be constructed and developed in TVET institutions equipped with state-of-the-art equipment and installed on the Internet to enable library users to access information resources by integrating expert systems.
- There is a need to employ adequate Techno-serving librarians in TVET Institutions who have knowledge and skills in electronic library management to assist library users in accessing the information using the Expert systems.
- Promoting and encouraging expert systems integration in all sections of TVET libraries will facilitate efficient and faster library operation and service delivery in the contemporary information and communication (ICT) technology era.
- Annual budgetary allocations on training should be included in tertiary institutions' budgets so that staff in all other departments could be trained on integrating Expert Systems in their departments. This would encourage prompt service delivery.

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36. Policy Challenges in Establishing Institutional Repository: Business Process Modelling of Universities in Uganda

Kizito Ongaya*; Emily Bagarukayo**; Benedict Oyo***; David Okello Owiny****

Gulu University
ongaya.kizito@gmail.com

**Makerere University*
ebagarukayo@gmail.com

Gulu University
***benoyo@gmail.com

****owinyd@gmail.com

Abstract

While many universities are establishing institutional repositories to improve their online presence, policy challenges are associated with implementing this innovation across universities in Uganda. The paper examines policy challenges associated with institutional repositories in six universities in Uganda. The study used an exploratory method, with simple random sampling, to ensure all university staff have an equal chance to participate. The samples were stratified into different categories to establish the length of services and seniority in a university setting. Due to the inability to meet participants physically, the snowballing method was used over Google Forms, which allowed staff to forward the questionnaire to their peers. The findings show that the ownership debate of institutional repositories is far from conclusion in institutions of higher learning, with over 50% of respondents asserting that the university should own all publication and research data. On the other hand, they also believe that authors should be the principal owners of the contents of their repositories. Availing publication on a repository is also an unsettling matter, with 89.4% of scholars claiming rights of distribution irrespective of publisher's restriction, while most scholars believe the Main Libraries in a university should take responsibility for dissemination; departments and individual authors are equally responsible for dissemination. Opinions on patent rights ownership are extremely divided across universities, faculties, and departments. This study outlines that the policy of IR should articulate the training and processes involved in its establishment and operations. The metadata standardisation should be associated with the Dublin Core, and staff should be responsible for the upload and approval mechanism. The policy must exhaustively articulate ownership issues, including restriction requirements, whether open or closed access and criteria for accepting and rejecting articles on the repository.

Keywords: *Institutional repositories, policies, higher educational institutions, universities*

1 Introduction

There is a general movement of university libraries to establish institutional repositories in their respective libraries for easy management, access, preservation and conservation of information resources. More importantly, universities would like to improve their webometric rankings, which has become an essential aspect of measuring the presence of universities. Another dimension is looking at institutional repositories as a means of public accountability for resources from public funds (Armstrong, 2014). Establishing an institutional repository has recently become commonplace within academic libraries, fueled by the availability and relatively simple implementation of several open-source software platforms and operating systems (Robinson, 2009).

This interest has been fed by a realisation that institutional repositories can not only improve access to research-related information, but at the same time, they can serve to extend the influence of a library

within a university (Carver, 2003). Fueled by the increasing Internet scholarship, institutional repositories provide easy self-archiving for authors (Chan et al., 2005). Motivated by these external forces and internal budget crises, academic institutions are building institutional repositories (IR) to capture, disseminate, and preserve the scholarly output of their researchers on a free and interoperable basis in digital format (Genoni, 2004; Hockx-yu, 2006). The movement gained momentum by releasing two open-source systems: Eprints, developed by the University of Southampton in late 2000, and MIT's DSpace in 2002. Both systems now have numerous installations (Chan et al., 2005). Free and open-source software is commonly used to develop an institutional repository in Uganda, African countries, and others worldwide. The most commonly used software to create repositories are Dspace, E-print, Fedora and Greenstone. This softwares makes online visibility and discoverability of institutional repositories possible (Eromosele et al., 2022).

The development of IR confers a changing landscape of work processes for librarians across universities. Libraries worldwide are moving from places to spaces, redesigning their services and information products, adding value to their services, and satisfying the changing information needs of the user community (Eromosele et al., 2022). Little studies have been done to demonstrate the new work process designs and services in universities in Uganda.

The study's objectives were to determine the work processes associated with establishing an institutional repository in a university setting in Uganda and to identify policy challenges associated with its implementation.

2 Literature review

An institutional (university-based) repository is a mechanism for capturing, archiving and managing the collective digital research outputs of the institution (Marsh, 2014). The term refers to research output digitally, such as journal articles or research data, e-thesis, e-learning objects, and teaching materials, or any other scholarly work such as theses and dissertations created by the faculty, research staff, and students of an institution, and accessible for end users both within and outside of the institution with few if any, barriers to access (Crow, 2002; Mezbah-ul-Islam, 2014). The rate at which universities adopt institutional repositories is high (Marsh, 2014), with many in developing countries. Based on the number of institutional repositories established over the past few years, the IR service appears attractive and compelling to institutions (Foster & Gibbon, 2005). "A university-based institutional repository (IR) is a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members" (Lynch, 2003)".*2.1 Promotion of open access through repositories*

A university-based digital asset management system is fast emerging as a critical component of the current debate on open access (OA) and the reform of the scholarly communication process. Some proponents of the open-access movement see the IR or open-access archive as the most cost-effective and immediate route to providing maximal access to the results of publicly funded research, thereby maximising the potential research impact of these publications (Chan, 2004). Open-access institutional repositories are a set of services that a university offers to its community members to manage and disseminate digital materials created by the institution and its community members. It is essentially an organisational commitment to stewardship of these digital materials, including long-term preservation where appropriate and organisation and access or distribution (Lynch, 2003; Yang & Li, 2015).

In Uganda, like the rest of the world, establishing institutional repositories is a means to achieve university library web visibility occasioned by open-source software availability (Baudoin & Branschofsky, 2003; Robinson, 2009). However, the development of repositories in academic libraries is technology-driven and demands stable Internet connectivity and the availability of human resources expertise (Ferreras-Fernández et al., 2013). Most universities in Uganda use DSpace software to implement their institutional repositories because of the relentless advocacy of the Consortium of Uganda University Libraries. DSpace means different things to different people and constituencies (Baudoin & Branschofsky, 2003). Sometimes, it refers to technology, such

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as DSpace, a computer application. DSpace followed the librarian's inclination to create a system that would be as easy as possible to implement and use rather than push strictly in the direction of digital library research, from which a more flexible system might have emerged (Baudoin & Branschofsky, 2003).

2.2 IR challenges

While establishing an IR, many challenges arise during the implementation. Soohyung Joo identified challenges associated with IR, such as limited resources, including insufficient budget and staff, as the primary factor preventing service development and/or deployment. The sheer amount of data, institutional support for metadata creation, and data sensitivity (Joo & Kim, 2019) are also challenges. Open access to scholarly activity poses concerns about copyright, plagiarism and sustainability. Staffing and funding IR initiatives are essential to sustain scholarship curation in the digital environment.

2.3 Process modelling

The role of business process models, as models in general, has been considerably changed from describing scenarios (contemplative models) towards actual coordinating activity execution (productive models) and from technical expert privilege to domain expert routine tasks (Ionita & Estublier, 2011). When driving any significant change within an organisation**,** strategy and execution are intrinsic to a project's success. Nevertheless, closing the gap between strategy and execution remains challenging for many organisations. Business processes are often messy, collaborative efforts that cross teams, departments and systems, making them difficult to manage within a hierarchical structure. Business process management (BPM) fills this gap by redefining an organisation according to its end-to-end processes so opportunities for improvement can be identified and processes streamlined for growth, revenue and transformation.

2.4 Policy gap associated with the establishment of IR

The Universities and Other Tertiary Institutions Act, 2001 provides for the establishment of the National Council for Higher Education (NCHE), its functions and administration and to streamline the establishment, administration and standards of universities and other institutions of Higher Education in Uganda and to provide for other related matters (Uganda Government, 2001). To this effect, the NCHE has established numerous guidelines and minimum standards for functional structures and business processes of universities and tertiary institutions. However, many business processes, especially in the management and operations of Institutional repositories, are not in place. It is also worth noting that the comprehensive revision provided for the Universities and Other Tertiary Institutions (Institutional Standards) Regulations, 2005 (Uganda Government, 2005) also does not articulate business processes associated with establishing institutional repositories. Each institution must use ingenuity to establish work processes and guidelines for managing its information. The development of repositories is a relatively innovation whose business processes need to be articulated to enable universities to cope with their operations. Unfortunately, this has not been done. Therefore, this paper attempts to point out policy challenges associated with establishing repositories across the universities in Uganda.

3 Methodology

The study used an exploratory method, with simple random sampling, to ensure all university staff have an equal chance to participate. The samples were stratified into different categories to establish the length of services and seniority in a university setting. This is because the research sought to investigate staff with substantial experience that is working experience of more than five years. Due to the inability to meet participants physically, the snowballing method was used over Google Forms, which allowed staff to forward the questionnaire to their peers. The online Google Forms questionnaire was distributed to staff of public and private universities in Uganda, namely Gulu University, Makerere University, Busitema University, Mbarara University, Uganda Christian University and Uganda Martyrs University. The responses were from 35 staff across the universities. This is sufficient because all six universities were represented. Interviews

were conducted with critical informers about a repository for documenting the business processes at Gulu University. The key informers are library staff who participated in institutional repository (IR) policy drafting and worked with the repository. Key policy documents associated with institutional repositories were examined to establish work processes and procedures coverage.

4 Results

While many of the challenges associated with establishing institutional repositories are enumerated in the literature, policy issues must be addressed for an effective operation.

4.1 The role of the library in the IR implementation process

The first challenge is determining a university's open or closed access policy line. This helps to determine the university's software necessity. In the case of Gulu University Library, the development of IR started with installing DSpace software as the preferred software. This is because it is open source and, therefore, can be modified as per the institution's needs. Several available experts within the country can support troubleshooting challenges associated with it. The second is creating communities, which are folders for organising document submissions in the IR. Once documents are received, agreed-upon metadata will be assigned, and the abstract and the document will be uploaded.

Thirdly, the approval process begins. Depending on the policy, uploading in an ideal situation should be done by individual authors. Often, the account created for them is called "submitters" or "E-people". However, a designated staff can perform the task for submitters. This, again, is by the university policy. For quality control of metadata and re-examining copyright issues associated with a given submission, a designated super-user would often perform the task of accepting or rejecting a submission.
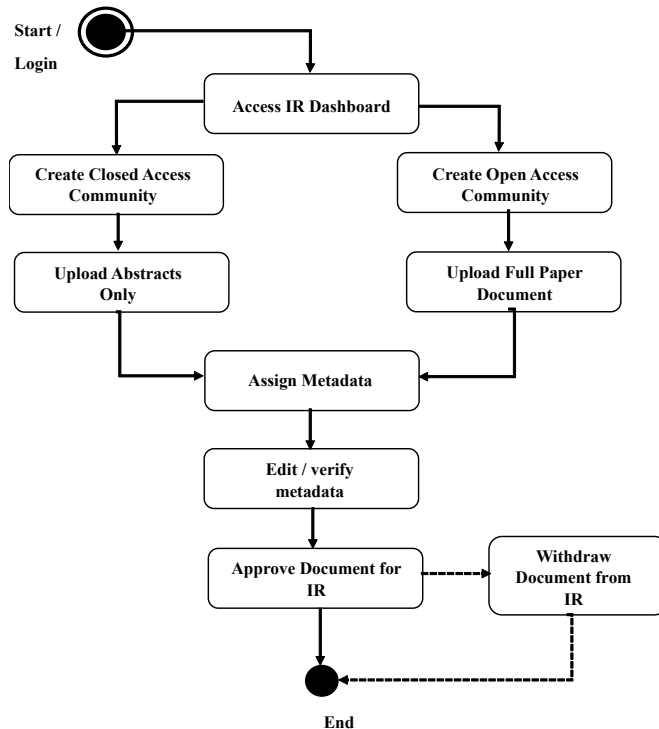

Figure 1: A process model of the role of the library in the implementation of IR

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The withdrawal process is initiated once it is discovered that there is a complaint about a document availed through the repository. Complaints may be because of sensitivity, copyright issues or requests from the researcher, department or management about a specific document. Whenever there is a complaint about a closed-access journal in which a university staff member is an author, access will be restricted, and only the metadata will be available through the repository.

4.2 Access to research articles in the repositories

In an educational context, a new university mission has emerged, supported by the transfer of open-access knowledge through Institutional Repositories (IR). Knowing the motivations and needs of the academic community to promote scientific dissemination using these platforms is essential (Gonzalez-Perez, 2018). However, this research shows that opinions are divided on which university organ should be responsible for authorising a research publication to be available through the repository.

Figure 2 shows that the majority, represented by 41% of respondents in Ugandan universities, support the idea that the Main Library should authorise publications to be available through the repository. The respective graduate school was among the highly recommended departments responsible for authorisation, scoring 15.4% of the respondents' views. 12.8% of respondents believe access authorisation should rest with the Quality Assurance Department and authors/researchers. The emergence of the ethics committee in the functions of a university is essential, with 10.3% of the respondents recommending that the access authorisation function rest with the committee.

Qn12. Who/Which organ of the University should be responsible to authorize a research publication to be availed through the Institutional Repository?
39 responses

Figure 2: Views of university staff on which university organ should authorise research publication through the institution repository.

Further, there are conflicting views about whether articles in closed-access journals published by members of a given university should be available over IR without infringing on the copyright of the journal that published the article. As we may note, a mature and fully realised institutional repository will contain the intellectual works of faculty and students – both research and teaching materials – and also documentation of the activities of the institution in the form of records of events, performances and the ongoing intellectual life of the institution (Lynch, 2003; Smith II, 2008).

In this research, 52.6% of staff across the universities in Uganda believe that they have the authority to authorise published works of a closed-access journal, which is of their own, to be available through their institutional repository. 36.8% emphasise that they equally own the work, and the closed access publisher has no right to stop them from distributing their works, especially over the institutional repository of an organisation where they work. However, a few of the respondents say they will only have pre-print versions of their publications to avoid conflicts with journal publishers.
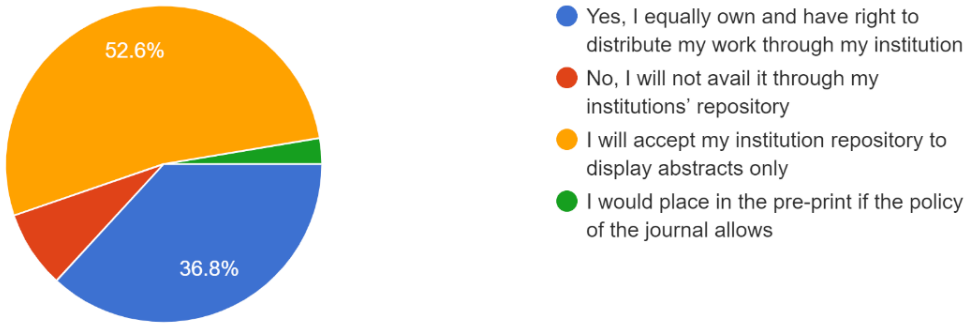
Figure 3: Views of university staff about open/closed access journals being available through the IR

The repository comes with a lot of new work processes: redundancy with other modes of disseminating information, the learning curve, confusion with copyright, fear of plagiarism and having one's work scooped, associating one's work with inconsistent quality, and whether posting a manuscript constitutes "publishing". In this research, the views of staff across six universities in Uganda were explored. Who / which university organ should authorise retention, withdrawal, and restricting access to research articles from staff for availability through the institutional repository?

Figure 4 shows that 38.5% of the respondents recommend that the main library of their respective universities be in charge of access control. 20.5% of the responses recommend that only the researchers should be responsible for access control. 12.8% of the respondents place their trust in the Quality Assurance Department to be in charge of access control. Further, some staff recommend that the Graduate School and faculty be in charge of access control of their article availability through the repository.
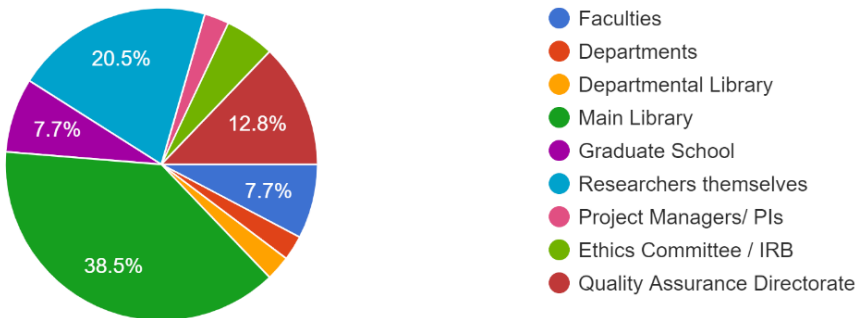

Figure 4: University staff views on who/which organ of the university should authorise retention, withdrawal, or restriction of access to research publications available through the IR

4.3 Patent ownership in the repository

The repository provides an opportunity for research and innovations to be available through it. Whereas journal publishers, especially closed-access journals, claim copyright ownership and even share benefits accrued from the sale of research publications of authors, institutional repositories provide no such encumbrance to innovators. In this research, we explored the views of university staff about who/which organ of the university should own patent rights, find potential funders, commercialise, provide legal service, and share benefits of innovations availed through the repositories.
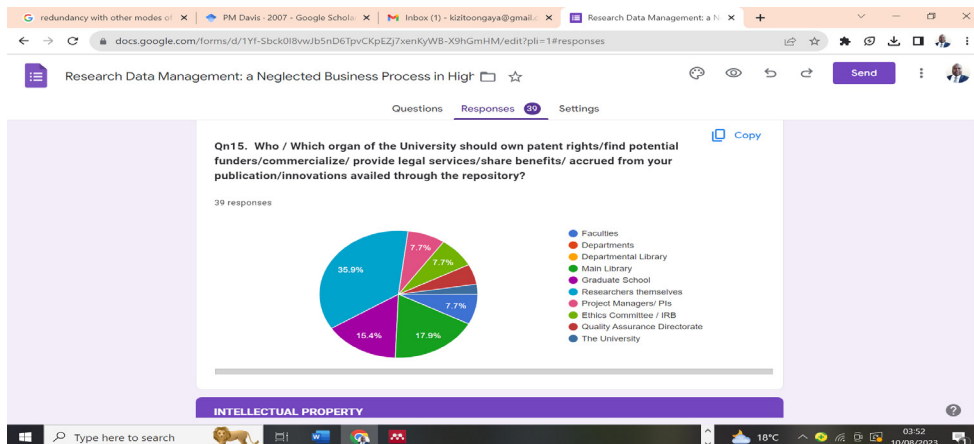
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Figure 5: Views of university staff about who/which organ of the university should own patent rights

As we can observe, opinions are divided, with 35.9% of responses in favour of researchers owning patent rights, 15.4% in favour of the graduate school, 17.9% in favour of the Main Library, and 7.7% of responses in favour of the project managers, principal investigators, and ethics committee respectively.

4.4 Ownership of research data

The time in which the researcher owns research data because he/she generated the research data does not appear to be the case in contemporary research today. Data has become the new currency of both the global economy and the scholarly community (OECD, 2017). Thus, scientific, research and scholarly communities around the globe are endeavouring for sound research data management and sharing practices.

In this survey Figure 6, the staff were asked who should own research data. It was established that the opinions of the scholars equally vary across the spectrum of the functional units of the university, researchers and funders. Of the 38 responses received, 50% believe the university should own research data. Nine respondents who comprised 23.7%, believe the faculties should take ownership, with 13.2% believing departments, 18.4% departmental libraries, 34.2% attribute ownership to the main libraries, 26.3% recommend the graduate school, 52.6% recommend ownership be left to individual researchers, 23.7% recommend that project leaders and principal investigators on the research data. In contrast, 2.6% believe other stakeholders, like the funders, should own research data.
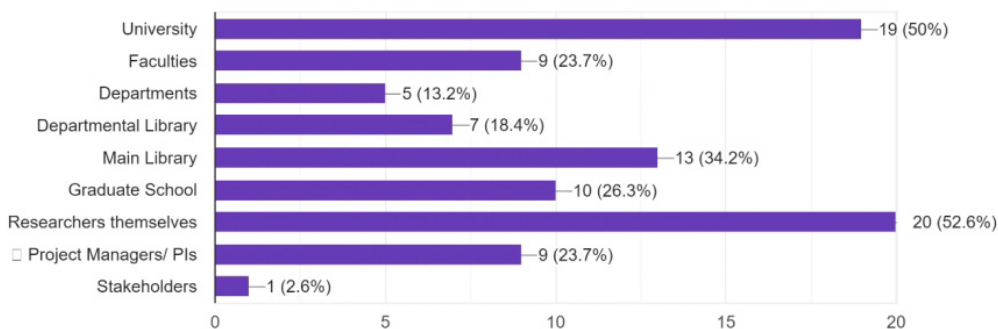

Figure 6: Opinion survey on who should own research data in a university setting

As observed, there is no consensus on who should own research data; however, significant considerations were recommended to the university and the individual researchers.

5 Discussion

Work Process Modelling of IR processes is not well documented in Uganda universities. In the case of Gulu University, some documentation is based on approved policy but leaves out crucial issues such as access, preservation, authorisation, abstracting, indexing, ownership of contents, quality assurance and staffing.

For some time now, the building of IR has been branded to disseminate research findings by scholars worldwide (Ezema, 2011). Establishing a repository means all her contents can be available online and worldwide. A university should have a clear policy on open access to not disadvantage its scholars when they have done novel research, resulting in patentable innovation, which would result in economic benefits. Availing such research and innovation over the repository will likely lead to leakage of trade secrets, piracy, plagiarism and, therefore, financial loss to the innovator.

Repositories provide exciting opportunities to preserve documents (Mapulanga, 2013) digitally. Digital preservation is a complex process, and many unsolved issues still make it a challenging task for institutional repositories. However, the broad deployment of institutional repositories also provides new opportunities for digital preservation. Much could be done to consider digital preservation from the outset, involve the authors, and embed digital preservation into repository workflow, which will ease later preservation tasks (Hockx-yu, 2006).

Organisations should lay guidelines for the acceptance and rejection of Articles on IR. National and internal copyright laws continue to be in force despite the development of IR worldwide. There should be a clear policy of acceptance and rejection of scholarly works in open- and closed-access journals, respectively. This will ensure that a university repository does not violate the copyright policies of individual journals whose authors may be members of an institution.

Although Dublin Core metadata management formats are applicable in most IRs, organisations need to agree on which fields to use and nomenclature formulations for articles going on the IR. While traditional print media has known metadata standards guided by Anglo-American Cataloging Rules (AACR), there are no such standards for document deposits in institutional repositories. Each institution should design mechanisms agreeable to the professional staff regarding their local standards. Such local metadata standards can be incorporated to become institutional policy for the repository's operation.

Institutions may find it necessary to standardise the abstracting and indexing of articles in IR. As we can observe, IR's advantages are numerous, especially in terms of ease of access to information. However, as institutions maximise these leverages, the policies should succinctly explore the type of documents to share over the repositories. For instance, council documents, reports, and special information that found their way into the IR for preservation and conservation may require abstracts or indexes only. These should be detailed in IR's guiding policy.

Ownership of contents in the IR should be articulated in the policy. In Ugandan Universities, as we can observe, opinions are divided with 35.9% of responses in favour of researchers owning patent rights, 15.4% in favour of the graduate school, 17.9% in favour of the Main Library, and 7.7% of responses in favour of project managers, principal investigators, and ethics committee respectively.

Institutions should establish workflow quality assurance of the IR. Whereas most universities have fully fledged Quality Assurance Departments in respective universities, many technical and non-technical aspects of IR need attention through corresponding policies. For instance, redundancy with other modes of disseminating information, the learning curve, confusion with copyright, fear of plagiarism and having one's work scooped, associating one's work with inconsistent quality, and whether posting a manuscript constitutes "publishing".

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Institutional repository management is a new trend that has hardly made its way into the curriculum of schools for library science in Uganda. Many library staff, therefore, learn on the job. Librarians must be conversant with the digital collection management and open archive information system management skills of their institutional repository. Library staff and authors must be trained to prepare documents in an acceptable format and submit content to the repository using a simple interface (Chan et al., 2005).

Therefore, this study outlines that the IR policy should articulate the training and processes involved in its establishment and operations. Metadata standardisation should be associated with the Dublin Core, and staff should be responsible for the upload and approval mechanism. The policy must exhaustively articulate ownership issues, including restriction requirements, whether open or closed access and criteria for acceptance and rejection of articles on the repository.

6 Conclusion

The paper established that work processes for IR are not well documented in the case of Gulu University. Some documentation is based on approved policy but leaves out crucial issues such as access, preservation, authorisation, abstracting, indexing, ownership of contents, quality assurance, and staffing.

Although views on IR access are divided widely among scholars, most university staff, up to 41% of scholars in Ugandan universities, support the idea that the Main Library should be responsible for authorisation of publication to be available through the repository. At the same time, others need that role to be executed by graduate schools as well as departments that originate the documents. In this research, 52.6% of staff across the universities in Uganda believe that they have the authority to authorise published works of a closed-access journal, which is of their own, to be available through their institutional repository.

Scholar's views are most divided when it comes to ownership of the contents of the repository. As we can observe, opinions are divided, with 35.9% of responses in favour of researchers owning patent rights, 15.4% in favour of graduate school, 17.9% in favour of the Main Library, and 7.7% of responses in favour of project managers, principal investigators, and ethics committee respectively.

7 Declaration

- Gulu University provided funding for this research.
- The authors reported no potential conflict of interest.
- Research data available for sharing on Google forms
- Ongaya, K. drafted the paper, Oyo, B. read through the draft and made corrections, Bagarukayo, E. Analysed the figures, and Okello-Owiny, D. made final editing.

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The information universe has changed drastically. Advanced technologies have facilitated a remarkable shift in how users search for and use information. Convenience, ease of use, personalisation, interoperability, and comfort are some attributes of the modern information universe that users treasure. Library and information services and products which do not reflect these attributes are increasingly shunned. Library and information workers need to re-imagine library services and products to remain relevant. The time to shift is now, as the longer they wait, the more they risk being pushed to the periphery as alternative information sources take their position in the core of the information universe.

This publication is a comprehensive resource, a collection of 36 creative papers providing invaluable insights on delivering information products and services in the digital era. Each of the 36 papers in these proceedings is a treasure trove of knowledge, discussing issues crucial to mastering the ropes of service design and delivery in the digital information era. The papers are grouped into seven categories and sections, providing a structured and comprehensive approach to the topic. The sections are:

- Best Practices in Records and Information Management;
- Emerging LIS Roles in the Digital Era;
- Information Ethics and Practices;
- Research and Digital Literacy;
- LIS Education and Training in a Digital Era;
- Responsive Information Service and Products; and
- Technology and Innovation.

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