ADOPTING SERVQUAL MODEL IN IMPROVING DIGITAL INSTITUTIONAL REPOSITORY INFORMATION SERVICES TO POSTGRADUATE STUDENTS AT UNIVERSITIES IN MERU COUNTY

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DECLARATION AND RECOMMENDATION

DECLARATION

This thesis is my original work and has not been presented for the award of a degree or any other award in any other university.

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Recommendation

We confirm that the candidate carried out the work reported in this thesis under our supervision.

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DEDICATION

To my grandmother Michelle Francis Julo and my mother Elizabeth Nadzua for providing

a firm foundation in my academic life.

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ABSTRACT

Service delivery in digital institutional repositories among university libraries has continued to demand multi-skilled workforce, competent and responsive employees who listen to customer's needs. This implicates directly on the nature of service delivery by librarians towards meeting the needs of their clients. However, digital institutional repository service provision has been unsatisfactory. Hence, the study aimed to determine how adopting SERVQUAL model can improve digital institutional repository information services to postgraduate students at universities in Meru County. The specific objectives were: reliability, responsiveness, tangibility, empathy and assurance towards improving digital institutional repository information services to postgraduate students. The study was underpinned by the SERVQUAL model. It also adopted a mixed-methods approach and a concurrent embedded research design. The target population constituted university library head of sections and post-graduate students. A sample size of 91 post-graduate students and 10 heads of sections librarians was adopted. Purposive sampling was employed to get the head of section librarians and simple random sampling for sampling post-graduate students. Data was collected using questionnaires and an interview guide. Data quality was achieved by checking construct, content and face validity, while reliability was checked using Cronbach alpha. The mean and standard deviation were computed for descriptive statistics and multiple regression analysis, for assessing the overall applicability of SERVQUAL model in repositories. Thematic analysis was utilized for open-ended questions and interview data. Findings were presented using tables, figures and narrations. Findings indicated that digital institutional repository service provision was significantly affected by all components of the SERVQUAL model. The study noted that effective service provision at the institutional repositories section requires reliability, assurance, empathy, responsiveness, tangibility, promptness, politeness, courtesy and demeanor. These aspects are supported by knowledgeable staff, customer care, adequate ICT infrastructure, facilities and technology; customer awareness, adequate funding, and information resources. The digital institutional repository service provision was curtailed by inadequate ICT infrastructure, staff competencies, facilities, information resources; non-vibrant feedback platform, low bandwidth and frequent downtime of the institutional repository webpage. Other drawbacks included limited student awareness and lack of postgraduate diploma research projects. The study noted that effective digital institutional repository service provision requires concerted efforts of repository managers, university management, university librarians, Directorate of Postgraduate, students and faculty. The study recommends need for university libraries to retool their staff, revise repository policies to incorporate awareness creation, and lobby for increase of library budget to cater for training, purchase of equipment and furniture. Heads of libraries should advocate for ICT infrastructure and facility development. They should also liaise with ICT managers for acquisition, upgrading, and maintenance of repository technology, and solicit University Management financial support for acquisition of necessary infrastructure and facilities. The findings implicate on competencies and professional development of library staff, stakeholders' involvement, ICT infrastructure development, physical facilities and revision of repository policy framework.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS & ACRONYMS

APA   American Psychological Association

KeMU   Kenya Methodist University

NACOSTI   National Commission for Science Technology and Innovation

SPSS   Statistical Package for Social Sciences

UN   United Nations

USA   United States of America

MUST   Meru University of Science and Technology

IR   Institutional Repository

DIR   Digital Institutional Repository

ORCID   Open Researcher and Contributor ID

CUE   Commission for University Education

SERVQUAL   Service Quality Model

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Digital institutional repository services are of great significance to both faculty and learners in institutions of higher learning. Therefore, digital institutional repository services need to be configured to serve the intendant users. This can be achieved by ensuing quick responses, timeliness in service delivery, dependability and application of customer centered approaches to information service provision. Notably, the advancement in information communication technologies (ICT) has fueled the development of digital institutional repositories by institutions of higher learning. Some of their application has been to enable them fetch scholarly research image, share their intellectual knowledge and preserve universities' scholarly communication outputs (Nayak & Parhi, 2021; Ogenga, 2015). Another recent trend is push for open access which became famous after the Budapest, Bethesda and Berlin conference open access declarations (Nayak & Parhi, 2021; Mwiti, 2017). This initiative was embraced by university libraries owing to their role to disseminate, preserve, communicate, share, market and manage scholarly communication (Makori et al., 2015; Shukla, 2016). The open access initiative led to the increasing need for quality information service delivery at universities and research institutions.

The establishment of digital institutional repositories at institutions of higher learning was traditionally meant to ensure submission, sharing, preserving and curating of journal articles, theses and dissertations (Bangani, 2017). This has helped to achieve information interoperability and open accessibility of research. The most popular adopted technologies

for hosting the services are open source software like DSpace, Eprints and Bepress (Bangani, 2017).

Institutional repository services comprise of range of open access services rendered to a research organization or an institution of higher learning by information professionals (Nunda & Elia, 2019). Some services delivered in digital institutional repositories range from acquisition, metadata creation, management, dissemination, preservation, providing access and stewardship on scholarly outputs (Karanja, 2017; Nunda & Elia, 2019). Other services provided in digital institutional repositories are the publishing of research output so that is readily available in open access basis (Kakai, 2018; Chilimo et al., 2017).

Service in digital institutional repositories are evidenced by the presence of training and awareness programs (Adam & Kaur, 2019; The Directory of Open Access Repositories [OpenDOAR], 2018). Others are; readily accessible services, timely, responsive, improved information find-ability and statistics showing increase in creative content deposits (Adam & Kaur, 2019; OpenDOAR, 2018). Other critical drivers of satisfactory services is the presence of perceived usefulness and ease procedure for depositing the created intellectual output by depositors (Fernández-Ramos & Barrionuevo, 2021). These aspects implore the need to explore the service qualities dimensions in the service quality model as well as the marketing strategies for communicating the institutional repositories' value as postulated in this study.

The SERVQUAL model is a service quality measurement tool developed by Valarie, Parasuraman and Berry marketing gurus in 1985 (Podbrežnik, 2014). It was aimed to measure the perceptions of the customers being served by meeting their expectations and experiences (Podbrežnik, 2014). In the very place, the model was meant to measure the

tangibility, reliability, responsiveness, communication, credibility, security, competency, courtesy, understanding the customer, and accessibility of services or products (Podbrežnik, 2014; Parasuraman et al., 1988). Later on, the modest narrowed down to five major dimensions which were; tangibility, reliability, responsiveness, assurance and empathy (Podbrežnik, 2014). The model has been tested and found applicable in various industries such as retailing, restaurants, banking, telecommunication industry, airline catering, local government, hotels, hospitals, and education sectors (Daniel & Berinyuy, 2010; Vencataya et al., 2019; Gathoni & Van der Walt, 2019; Trivedi & Bhatt, 2020). Its adoption has been found to influence customer satisfaction, customer retaining, organizational performance and corporate marketing (Daniel & Berinyuy, 2010; Vencataya et al., 2019; Gathoni & Van der Walt, 2019; Trivedi & Bhatt, 2020). This study adopted this model to determine its applicability in digital institutional repository information service delivery at universities in Meru County.

Adopting institutional repositories and leveraging information services therein has brought forth tremendous benefits worldwide. On this hand, university communities are benefiting from repository services. For example, achieving scholarly communication, increased institutional visibility and unlocking the potentials of grey literature deposited in form of theses and dissertations (Kakai, 2018; Anenene et al., 2017). On the other hand, dissertations, publications and conference papers preserved in digital institutional repositories are: basis for organizational knowledge management and podiums for publishing peer-reviewed contents. The digital institutional content also enhance university feasibility ranking (Kakai, 2018; Anenene et al., 2017). It is also worth noting that, well offered services attracts growth in scholarly publishing and enhances compliance to open

access standards (Korkuvi et al., 2017). Besides, it increases individual author citations and visibility, safeguard authorship control, influence the cost charged for publishing and also increases scientific research (Korkuvi et al., 2017; Saini, 2018; Nunda & Elia, 2019).

The growth of digital institutional repositories worldwide was initially witnessed in developed nations where, Europe was leading in service provision, followed by North America, Asia, South America and Australia (Jani, 2011). There is great potential for digital institutional repository success owing to steady growth, development and new innovations reported in Harvad, England, United Kingdom, Boston and Hong Kong. Additionally, the success is attributed to the adoption of open archive digital institutional repository initiatives (Jain, 2011; Roy, 2018). Over the years, growth and development in content composition, operational styles, and accessibility have noticeably been improved across the globe to achieve efficient service provision (Sims et al., 2019).

Other noticeable trends for fostering growth and development of digital institutional repository services are; increasing indexing rates with search services on Google scholar and integration of unique identifiers like open researcher and contributor ID (ORCID) (Sterman, 2014). Others are, integration of international standard name identifier (ISNA), scholarships for populating the platforms, outreach services to make awareness and budget funding (Sterman, 2014).

Universities across many nations have prioritized establishment and utilization of digital institutional repository services. This is by making them mechanisms to promote awareness on predatory publishers and promote self-archiving initiatives for open access to their faculty (Adam & Kaur, 2019; Ferreras-Fernández et al., 2018). The open access initiatives

and digital institutional repository services also ensure long-term preservation initiatives for scholarly works of archival value (Zhong & Jiang, 2016).

Institutional repositories in university libraries are highly prioritized in the United States of America, in United Kingdom and Australia (Arlitsch & Grant, 2018; Callicot et al., 2015). These dominant observations are backed up by the tremendous advancement of technologies and availability of software for library management. Other prominent drivers of the same lie in deep efforts channeled on human, fiscal and material resources (Callicot et al., 2015; Luther, 2018).

Some of the digital institutional repository information services provided to staff and students by university libraries include digital content preservation, scholarly dissemination and content storage services (Shrestha & Saratchandra, 2022). Information asset management, resource discovery, research evaluation and assessment are also among the key services delivered by an operational digital institutional repository (University of Alabama Library, 2022). Other activities include; information literacy and training on academic integrity, content indexing, copyright and intellectual rights guidance (Shrestha & Saratchandra, 2022). Furthermore, improving information find-ability through metadata services, spearheading submission processes and content identifier services also qualify the services offered therein (University of Alabama Library, 2022).

In The United States of America, quality service delivery and utilization of institutional repositories has continued to flourish among faculty and research community (Luther, 2018). Some of the measures put in place to make digital institutional repositories in libraries work, are linked to data interchange standards. Also, provision of current metadata, adopting quality and best curating software and factoring on customers

experiences (Luther, 2018). Other observable features from university institutional repositories from USA is user friendly links with directive guidelines and friendly interfaces (Saini, 2018).

The place of policies in manning and developing repositories has also taken their course. These include the implementation of institutional open access policies and enactment of mandatory deposit open access policies. Other dominant legislations point on deploying models for open access initiatives, good practices and publishing of institutional repository platform reforms (Callicot et al., 2015). Furthermore, policies adopted for running digital institutional repositories address important facets on faculty trainings and pedagogy measures, which to a large extent, contribute to quality service delivery (Cox, 2016).

Notably, the human resources mandated to run and manage the digital institutional repository library sections go through professionalism, hands on skills and interpersonal competence development programs in the United States of America (Bandyopadhyay & Boyd-Byrnes, 2016; Lagzian et al., 2015). Some commitments towards digital institutional repository managers are conducting staff training and professionalism enhancement. These trainings' success is dependent on supportive management which prioritize on quality service delivery by allotting fiscal resources and motivating the staff (Atkinson, 2019; Giesecke, 2011).

In Malaysia, Pakistan and India effective information service provision in digital institutional repositories among university libraries have remained unmeet (Bandyopadhyay & Boyd-Byrnes, 2016; Lagzian et al., 2015). This is so, irrespective of tremendous efforts directed towards revamping the sector such as by creating awareness to scholars and faculty members (Bandyopadhyay & Boyd-Byrnes, 2016; Lagzian et al.,

2015). Specifically, opinions from a variety of scholars recommend university scholars and faculty to buy in, cooperate and find interest and pleasure in accessing repository services (Cox, 2016). Other outlined efforts for remedying the situation are, investment on building the services, marketing and repository products' painting (Lagzian et al., 2015). Other dominant mechanisms are effecting frameworks mandating deposition, assurance of technical, technological, maintenance and metadata support services (Cox, 2016; Sterman, 2014; Atkinson, 2019). Notably, uncooperativeness in availing research contents to the university repositories by the university research community has been hinged to lack of strategy in developing author-self-interest. More factors which have explained the trend are, lack of reporting statistics to depositors and changing the role of a librarian from a preservation manager to publishers' (Cox, 2016; Atkinson, 2019). These challenges interested the study to consider the roles of repository manager with reference to SERVQUAL model (Parasuraman and Berry, 1988) to attract university community member's willingness to self-archiving. Given that the SERVQUAL model was aimed to measure the perceptions of the customers being served by meeting their expectations and experiences, the impact of tangibility, reliability, responsiveness, assurance and empathy of repository information service provision was ascertained. (Podbrežnik, 2014; Parasuraman et al., 1988).

In the developing nations, alike scenario in relation to service delivery is ascendant. Okoroma (2018), Oguche (2018), Ejikeme and Ezema (2019), Dlamini and Snyman (2017) and Tapfuma and Hoskins (2019) have indicated that Botswana, Nigeria, Zimbabwe and South Africa nations treasure the benefits, productivity and contributions of digital institutional repository services in institutions of higher learning. According to Oguche

(2018) and Anenene et al. (2017), repositories have stimulated access to large range of gray literature. Other notable contributions are on international knowledge sharing, institution identification, intellectual output preservation and efficient service delivery. Other benefits outlined by Oguche (2018) and Anenene et al. (2017) are the improved stewardship of memories, innovation, bridging digital divide, scholarly communication and posterity.

Common to the industrialized countries, African nations are adopting and investing in digital institutional repositories. Some compelling reasons which have necessitated the growth of digital institutional repositories services comprehend to increased awareness on the services (Aghwotu & Ebiere, 2016). Moreover, financial disbursement to support service provision among the library departments, availability of open access software and revamping of undesirable users' perceptions has attracted their growth and establishment (Aghwotu & Ebiere, 2016; Oguche, 2018; Jain et al., 2015; Okoroma, 2018). There are other measures which have been put in place by university libraries to ensure perpetuity of digital repository services. Some of these are: the assumption of technological infrastructure, electrification of both urban and rural areas. More measures in place are; training and retraining of staffs, increasing internet bandwidth in operational premises and disbursing fiscal resources (Ejikeme & Ezema, 2019; Ezema & Onyancha, 2017). Other pursuant mechanisms adopted by other libraries is the shift of preservation repository role to publishing (Ezema & Onyancha, 2017).

Irrespective of the above reported efforts in place, most established institutional repositories are encountering difficulties and inefficiencies in service delivery (Okoroma, 2018; Ezema & Onyancha, 2017; Anenene et al., 2017). The need for refurbishing the digital institutional repositories by university libraries is thus, a, must do undertaking to

realize the said benefits (Posigha & Eseivo, 2022; Ejikeme & Ezema, 2019; Ifijeh et al., 2020). Aspects of remedy that have been put in place to improve digital institutional repository service delivery include enacting open access policies, adopting creative common licenses and intellectual property rights (Posigha & Eseivo, 2022). Other efforts include alleviating customer' negative perceptions and attitudes and partnering with institutional funding bodies (Posigha & Eseivo, 2022; Ifijeh et al., 2020). Notably, digital institutional service delivery in African university repositories has also been remedied by creating awareness to the user community members (Adam & Kaur, 2019; Ifijeh et al., 2020).

In spite of the fact that there exist probable avenues for growth of digital institutional repositories and better service delivery among university libraries, unrivalled shortcomings continue to distract service delivery improvement practices. A number of recurrent challenges include; inadequate policies mandating faculty submission of gray literature, lack of familiarization with the services offered, staff incompetence, and lack of awareness by students and the members of staff (Baro & Eze, 2017; Bangani, 2018; Mutsvunguma, 2019; Atiso et al., 2017).

South Africa, Zimbabwe and Nigeria have addressed the inconsistences of poor service delivery in university library repositories by utilizing high profile researchers and grant funders to conduct advocacy (Mutsvunguma, 2019). Other measures include developing ICT skills among university library workers and rewarding self-archiving and regular depositors (Ratanya & Muthee, 2018). To ensure thrive of university digital repositories, awareness on plagiarism and academic integrity matters and implementation of obligatory open archiving policies has been implemented (Tapfuma & Hoskins, 2019). Other

corrective mechanisms are; encouraging governmental and grant funder open access initiatives (Tapfuma & Hoskins, 2019; Dlamini & Snyman, 2017).

In Kenya, digital institutional repository service delivery is recognized for the development of scholarly image and growth of research and publication processes (Ratanya, 2017; Ogenga, 2015; Sang et al., 2021). Consequently, institutions of higher learning have invested in adopting institutional repositories by developing and implementing working policies informing open access matters, copyright issues, depositor's agreements and accessibility of deposited objects (Ratanya & Muthee, 2018). Another notable step undertaken is the adoption of free open source software and investment in ICT technologies to enhance service provision. The commission for University Education (CUE) also is in the fore front in providing guidelines on library buildings. Apart from this, it plays a role in assuring quality in library products and services by inspecting the repositories (Commission for Universities Education ACT, 2019). The Commission for University Education stipulates that institutional repositories should be housed within the library and that digital collection service point provision be established to facilitate research, preservation and archiving of the university intellectual outputs (CUE, 2014).

The growth of digital institutional repository services among university libraries have been qualified through implementing affiliation and compliance to the open archive initiatives for attaining interoperability and knowledge management (Mugambi & Ongus, 2016; Karanja, 2017). Campaigns and awareness programs, staff training, and financial allotment have also been provided by universities to develop a visual image of the services offered in repositories (Karanja, 2017). When all these parameters are in place, they ensure that universities are committed to ensuring institutional repository services are perpetually

growing, services are provided in timely manner and that best preservation solutions are adopted.

In spite of that, there has been unsatisfactory service delivery, limited awareness, lack of comprehensive digital institutional repository policies, operational frameworks, limited staff involvement in submitting, and less curation of scholarly works (Kakai, 2018; Mwiti, 2017). The criticism have been linked to lack of adequate managerial support, staff competencies, limited awareness and insufficient rendering of budget to support repository services (Ratanya, 2017; Ratanya & Muthee, 2018; Nunda, 2019; Sang et al. 2021). Most of these critics require the staff involved in repositories to develop mechanisms to disseminate information and create awareness about the contents available to staff and students. The execution of such duties comprises array of institutional repository services offered. It is with regard to this, that the study applied the SERVQUAL model (Parasuraman and Berry, 1988) (reliability, responsiveness, tangibility, empathy and assurance) in establishing how the model could be adopted to improve institutional repository services offered to post-graduate students at Kenya Methodist University and Meru University of Science and Technology.

At Kenya Methodist University and Meru University of Science and Technology, digital institutional repository services are already in place. The establishment of digital institutional repository plays a critical role in advancing scholarship. It is also critical in enhancing the university research visibility, preserving intellectual communication and promoting research and development (Mwiti, 2017). Since their launch in 2013, the digital intuitional repositories have grown exponentially as characterized by operational policy, growth of submissions by students, creation of awareness on services offered and

engagement of competent staff (Mwiti, 2017). However, it is worth noting that low submission of content by university scholars and faculty members is still a glaring challenge facing the institution repositories. This adds to the concern on reactions, perceptions and expectations of customers on nature of services they receive.

1.2 Statement of the Problem

Institutions of higher learning have embraced the utilization of digital institutional repositories as avenues to preserve, market, disseminate, capture, store and manage their scholarly and intellectual outputs. Consequently, there has been unprecedented growth of open access repository software solutions. Universities in Meru County have adopted the DSpace, an open access institutional repository software to preserve and disseminate their open access research contents. The KeMU and MUST have also invested heavily in physical, hardware, software and human resources for ensuring their research outputs are perpetually available and usable. This guarantees efficient and effective digital institutional repository service delivery. Moreover, the universities have developed digital institutional repository policies to guide the operationalization, management, dissemination and preservation of the university scholarly output. Ideally, these mechanisms are expected to foster research and development, improvement of institutional repository services, community outreach and utilization of digital institutional repository resources by the staff and students.

Despite the establishment of digital institutional repositories, development policies, and having awareness programs, institutional repository service provision in KEMU and MUST is characterized by low utilization of repository resources by post-graduate students (Mwiti, 2017; Ogenga, 2015; Kakai, 2018). This might be attributed to weak staff

capacities, low awareness on institutional repository services and ignorance on the benefits of utilizing scholarly work deposited in the institutional repository (Kakai, 2018). Other reasons are fear of plagiarism and dwarf knowledge on multiple advocacy strategies (Mwiti, 2017; Ogenga, 2015; Kakai, 2018). This deficiency raises question on the nature of services offered by libraries to postgraduate students. Studies done by Asadu (2018) Gathoni and Van der Walt (2019), Alam (2020), Trivedi and Bhatt (2020) have demonstrated successful application of the SERVQUAL model constructs (Parasuraman and Berry, 1988) in improving university library information services. Consequently, the study endeavored to investigate the linkage and applicability of tangibility, reliability, responsiveness, empathy and assurance dimensions (Parasuraman and Berry, 1988) towards improving digital institutional repository service delivery at universities in Meru County.

The failure for the digital institutional repositories to improve its services, denies the university the chance to grow its research image and negate the value of research output on social-economic development. The existing research expose the factors leading to dismal utilization of academic repositories, the adoption of institutional repositories, aspects of technology acceptance in institutional repositories and challenges of running digital institutional repositories (Saulus et al., 2017; Mwiti, 2017; Ogenga, 2015; Kakai, 2018; Nunda, 2019; Fasae et al., 2017). However, aspects on digital institution repository service delivery with respect to SERVQAL model dimensions (Parasuraman and Berry, 1988) have not been investigated. This showed a research gap which the study wished to address by examining how the adoption of SERVQUAL model (Parasuraman and Berry,

1988) can improve digital institutional repository services offered by libraries at universities in Meru County.

1.3 Purpose of the Study

The study was set out to assess how application of the SERVQUAL model improves the institutional repository services offered by libraries to post-graduate students at universities in Meru County with an aim provide recommendations meant to streamline practices and policies.

1.4 Objectives of the Study

The following were the study objectives:

  i.   Determine the reliability of digital institutional repository service provision at selected universities in Meru County

  ii. Assess the responsiveness of digital institutional repository service provision at selected universities in Meru County

  iii. Examine the tangibility of digital institutional repository service provision at selected universities in Meru County

  iv. Determine the empathy aspect of digital institutional repository service provision at selected universities in Meru County

  v.   Assess the assurance of digital institutional repository service provision at selected universities in Meru County

1.5 Research Questions

The study was guided by these research questions:

  i.   To what extent are digital institutional repository services offered at selected universities in Meru County reliable?

ii.   What is the level of responsiveness of digital institutional repository services offered at selected universities in Meru County?

iii.   What is the level of tangibility of digital institutional repository services offered at selected universities in Meru County?

iv.   What is the level of empathy of digital institutional repository services offered at selected universities in Meru County?

v.   What is the level of assurance of digital institutional repository services offered at selected universities in Meru County?

1.6 Significance of the Study

The study was envisioned to offer an in-depth understanding of the status and applicability of SERVQUAL model aspects on institutional repository services among post-graduate students. It has contributed new knowledge on the applicability of SERVQUAL model components in improving service provision in digital institutional repositories among university libraries. The study informs policy makers, research institutions, institutional repository managers, faculty and the user community on the best practices for improving digital institutional repository service provision. The study expands the understanding on how the level of reliability, responsiveness, tangibility, empathy and assurance affect digital institutional repository service provision.

Findings are significant to the institutional repository managers in higher education research institutions. Repository managers are positioned to offer improved services upon utilizing reliability, responsiveness, and tangibility, empathy and accessibility aspects of the SERVQUAL model as presented by Parasuraman and Berry in 1988 in their day to day service. Valuable insights derived from the model would alter manager's communication,

marketing strategies, information repackaging mechanisms and service delivery approaches towards ensuring improved service delivery.

Meru University of Science and Technology and Kenya Methodist University are among the primary beneficiaries. Findings reported by the study guide the libraries and institution' management to device strategies geared towards improving post-graduate use and submission of their published work to increase the university research visibility.

The university management benefits by adopting comprehensive institutional repository policies which incorporate staff professional development, repository staff employment, library budget allocation and infrastructure development. This is also meant to guide the upgrading of the DSpace software.

The library staff also finds value in the presented findings. Having determined the adoption of SERVQUAL model in improving service provision, advocacy programs will be developed to improve utilization of the services by the post-graduate students. Librarians will also develop and organize training and development programs relating to institutional repository matters. These will focus on access and sensitize the post-graduate students on the need to utilize and submit their research output to the university digital repository.

Post-graduate students as well benefit from the study. Recommendations aired out are meant to improve service efficiency and effectiveness which will enable this user community to experience reliable services. Apart from that, responsiveness coupled with attendance by empathetic staff will contribute to their service satisfaction.

1.7 Scope of the Study

The study assessed how application of the SERVQUAL model (Parasuraman and Berry, 1988) improves institutional repository services to post-graduate students at Kenya Methodist University and Meru University of Science and Technology. It involved the post-graduate students and library heads of sections from the main campuses of KeMU and MUST hence Mombasa, Nairobi and Marimba Campuses were not part and parcel of the study respondents'. The study therefore, excluded the under-graduate students and university teaching staff.

Specifically, the study covered reliability, responsiveness, tangibility, empathy and assurance to ascertain the improvement of digital institutional repository services to post-graduate students at KeMU and MUST. The study did not focus on other pertinent aspects which may improve institutional repository services such as staff competencies, financial resources and institutional repository frameworks.

1.8 Limitations of the Study

The study made use of a concurrent embedded research design. For this reason, the research did not investigate digital institutional repository service delivery in a longitudinal basis. Noting that the SERVQUAL model aspects (Parasuraman and Berry, 1988) purported to improve digital institutional repository services might be investigated in a longitudinal basis in order to access their impact over a period of time, the negation posed some limitations. This was however overcame through obtaining comprehensive primary responses from the respondents by pre-testing the students' questionnaires. Henceforth, reliable and valid descriptive insights outlining the actual situation enabled recommending

of possible practices, mechanisms and aspects to improve digital institutional repository services to post-graduate students at selected universities in Meru County.

The study was also subject to sample opinion limitations. This is because, the research depended on data primarily collected through questionnaires from post-graduate students and interviews for librarians who, spoke their minds, experiences, insights and views in writing and oral presentation respectively. This was overcome by exhorting the respondents to openly and truthfully respond to the questions during instrumentation.

Lastly, the study was limited to the five SERVQUAL model constructs as guided by Parasuraman and Berry. Therefore, it was guided by reliability, responsiveness, tangibility, empathy and assurance aspects of the SERVQUAL model (Parasuraman and Berry, 1988) for ascertaining the improvement of institutional repository services to faculty at selected universities in Meru County.

1.9 Assumptions of the Study

The research supposed that:

i.   Post-graduate students are fully aware of digital institutional repository services offered by the selected university library departments.

ii. The SERVQUAL model aspects possess some degree of positive influence for improving digital institutional repository services to faculty at selected universities in Meru County.

iii. The SERVQUAL model dimensions are applicable in determining the quality of digital institutional repository information services at selected universities in Meru County.

1.10 Operational Definition of Terms

Institutional repositories

Are online open access locus utilized by research institutions to market, store, maintain, preserve and disseminate their faculty, students and user community intellectual outputs

University teaching staff

Refers employed individuals in a campus who carry out teaching and administrative obligations of the university

Institutional repository services

These are a range of activities cutting across from the collection, archiving and preservation to dissemination of university community intellectual output, creative contents, journals, thesis and dissertations and conference publications.

SERVQUAL Model

This is a multidimensional service quality model utilized by researchers to ascertain service efficiency, users' expectations, perceptions and views alongside five aspects (reliability, responsiveness,

tangibility, empathy and accessibility) as presented by Valarie, Parasuraman and Berry (1988) marketing gurus.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter details the review of literature on digital institutional repository services and SERQUAL model constructs. The presentation of the study variables flows in accordance to the objectives of the research. The chapter begins with review of the dependent variable which is digital institutional repository service delivery. This is followed by a comprehensive overview of SERVQUAL model constructs; reliability, responsiveness, tangibility, empathy and assurance (Parasuraman & Berry, 1988). The chapter concludes with the description of the theoretical and conceptual frameworks.

2.2 Digital Institutional Repository Information Service Delivery

Efficient and effective digital institutional repository services among university libraries are key infrastructural endeavors for attaining scholarly communication. Open access services have gained a lot of momentum among digital repositories as avenues to ensure perpetual delivery of services (Trivedi & Bhatt, 2019). Quality digital institutional repository service delivery has also been embraced to satisfy research community needs, ensure preservation of universities' knowledge and dissemination of information (Lassere & Whyte, 2021). Digital institutional repository service providers among university libraries have responded, reacted, transformed and adapted new technologies. Other noticeable responses is the change in the way they offer their services in order to remain relevant in the information age by focusing on the users as customers (Janse van Vuren, 2022).

Digital institutional repository service provision refer to scholarly knowledge management mechanisms that utilize software at the disposition of service providers to manage, offer storage and disseminate research output of a university research community (Murugan, 2016). Saini (2018) has described digital institutional repository services to constitute interoperable platforms with web based databases, run by open-archive initiate software which ensure long-term preservation, collection management, storage, usage and dissemination of university publications. Yet another research has defined institutional repository services to comprise a range of open access services rendered to a research organization or an institution of higher learning by information professionals (Nunda & Elia, 2019).

Some of the digital institutional repository services are: articles and gray literature, metadata creation, information management, dissemination, preservation, providing access and stewardship on scholarly outputs (Karanja, 2017; Nunda & Elia, 2019). Other services provided in digital institutional repositories are: publishing of research output so that, is readily available in open access basis (Kakai, 2018; Bangani, 2016). Apart from these, post-graduate students access the digital institutional repository section in the library to make consultations and be trained on academic research and integrity (Trivedi & Bhatt, 2019). Digital institutional repository managers also digitize all submitted theses and dissertations by scanning and then publish them for ease accessibility (Digby, 2021).

Effective and efficient digital institutional repository services are evidenced by readily accessibility of hosted services (Adam & Kaur, 2019). Also, timely delivery of services, responsiveness, easy information find-ability and statistics showing increase in content depositions (The Directory of Open Access Repositories [OpenDOAR], 2018; Adam &

Kaur, 2019). Other indicators of efficient services is the perceived usefulness of preserved items and uncomplicated procedures for depositing intellectual output (Fernández-Ramos & Barrionuevo, 2021). The growth of number of deposited items, increased institution visibility and institutional citations also indicate growth, establishment and effective repository services (Ratanya, 2017).

Notably, quality digital institutional repository service provision possess numerous benefits to universities. Investment in these interoperable platforms enable universities to enjoy wide range knowledge sharing and flexible way of scholarly communication (Bashir et al., 2021). More benefits are associated with, better management of special collections like theses and dissertations and a leveraging tool for lowering publication expenses (Bashir et al., 2021). Apart from earning a research visibility by a university, repositories fetch citations, eliminate duplication of publications, and encourage self-archiving, information readability and knowledge accessibility (Digby, 2021).

However, digital institutional repositories are facing some challenges which hinder efficient service provision. Consequently, digital institutional repositories face little university community participation, limited managerial support, limited internet bandwidth and dependence on foreign policies (Trivedi & Bhatt, 2019; Hossain, 2016). Apart from that, challenges related to student apprehension to infringe publisher copyrights, limited awareness, gaps between customer's specifications and expectations, limited responsiveness and limited customers assurance are evident (Trivedi & Bhatt, 2019; Hossain, 2016). Other challenges hindering digital institutional repository service delivery lie in the knowledge and courtesy by employees working in the library section, the appearance of physical resources and changing expectations of users and budgetary

23

constraints (Mohindra & Kumar, 2015; Trivedi & Bhatt, 2019; Gathoni & Van der Walt, 2019). This raises a concern on the service quality of digital institutional repository hence the need for the study which investigated the impact of adopting SERVQUAL model (Parasuraman and Berry, 1988) constructs to improve digital institutional repository services.

In developed nations, digital institutional repository services are anchored by a variety of factors, policies and guidelines. Narlock and Brower (2021) and Rodrigues and Shearer (2017) studies have illustrated on the need for university libraries to have comprehensive top-down, bottom-up and institutional-based policies. These are meant to articulate access rights, copyright issues, deposit agreement criteria, preservation techniques, creative common licenses and means of populating the repository. These researchers identified that the comprehensiveness of the policies was paramount for ensuring effective service delivery to customers. This is in line with the specified clear procedures for acquiring materials, populating the repository and ensuring security of depositor's materials. Moreover, enforced policies ensured security of deposited knowledge presented by the clear access controls and knowledge back-ups.

Apathy and empathy have been instituted as prerequisites for effective service delivery and increased usability of institutional repositories in the United States of America and United Kingdom. In view, and focus on the usability of digital institutional repository services, Fralinger and Bull (2013) and MacIntyre and Jones (2016) established that an IRUS-UK system for repositories was very efficient enough for measuring usability and number of successful downloads in the platforms. Apart from this, usability of these platforms was reported to be low in the qualitative studies. Findings opined that repository administrators

either minded little about the usability of the services they offered or were ignorant of their user community needs. Repository managers were required to undergo training on record keeping and customer care management in order to realize usability of digital institutional repository services. The current study focused on service delivery unlike the previous ones which were based on the usability of services. Moreover, other aspects of service provision apart from usability such as dependability, accessibility, courtesy and responsiveness were interrogated.

In Swaziland, digital institutional repository services was linked to accuracy and dependability levels. Saulus (2018) and Saulus et al. (2017) conducted a study to investigate this phenomena among teaching and postgraduate scholars in the University of Swaziland. As guided by the SERVQUAL model (Parasuraman and Berry, 1988) to underpin the constructs of the study, it was revealed that the university community were not satisfied with the services that were offered by the digital institutional repository service providers. The reported factors from the mixed methods approach which utilized questionnaires and interview guides informed that services were hindered by expectations, performance and facilitating condition gaps. Specifically, the utilization and interest for learners to make use of the repository services was not dependable due to poor internet connectivity and little awareness creation programs to learners during orientations. Recommendations articulated the need to improve the dependability of services by increasing the internet bandwidth and creating awareness through word of mouth, orientations, brochures, fryers, conferences and workshops.

Effective digital institutional repository services are dependent on tangibility, which is, the quality of facilities, human resources and resource availability. In Bangladesh, Alam

(2020), Karim (2018) and Alam (2021) investigated the aspect of user satisfaction with respect to the nature of facilities. The quantitative studies which adopted SERVQUAL constructs to rate the quality of services focused on administrator's behaviour, professionalism, tangibility of repository services and library responsiveness. Data gathered using questionnaires revealed that, limited, inadequate and poor library facilities diminished the tangibility of services. Moreover, staff responsiveness was found significant in impacting service delivery while housing resources sensitive to the user needs was an added advantage. Recommendations stressed on customer care training for staff and development of library infrastructure. Apart from that, building of the existing collections was also identified as a working remedy for meeting user needs sufficiently. The studies were however based on all departments of university libraries unlike in the study which assessed service delivery in the digital institutional repository sections. The study did not only determine the status of tangibility, responsiveness and meeting of user needs but also include other SERVQUAL contracts such as empathy, assurance and reliability for enhancing digital institutional repository services to post-graduate students.

The role of reliability of services in enhancing quality service delivery among library dockets cannot be overemphasized. Trivedi and Bhatt (2019), Bandara et al. (2021) and Hossain (2016) accessed this in India and Bangladesh respectively as guided by the SERVQUAL model variables (Parasuraman & Berry, 1988). These researchers identified that satisfactory service delivery among library institutions depended exclusively on the caring nature of the staff, their competencies and skills, adequacy of resources and making the library a tangible place. The findings reported, which were majorly gathered through questionnaires, stressed the need for conducting trainings to staff in order to enrich them

with customer management skills such as providing services in the promised time, courteously, responsively and assisting users to get information they need within a short time. However, these studies were based in university libraries where questionnaires were utilized to measure service dimensions. This study determined service delivery among digital institutional repositories and used both questionnaires and interview guides to gather data from post-graduate and head of section librarians.

In the developing nations, such as Nigeria, Tanzania, South Africa and Zimbabwe studies indicate appreciation of the role digital institutional repositories in enhancing institutional scholarly visibility (Anenene et al., 2017; Mooketsi, 2020). Despite the experienced challenges, African countries have improved their digital institutional repository service delivery by adopting information communication technologies, information access strategies, quick downloading and making the library a place (Antasari et al., 2021). Service delivery for library services have also been found to improve student's motivation to access and satisfy their needs. In response to this, digital repository services in the university libraries, have been qualified by improving convenience, ease of navigation, timelessness, accessibility, availing equipment, ensuring resource availability and improved self-reliance (Antasari et al., 2021). Apart from that, the utilization of SERVQUAL model constructs as underpinned by Parasuraman and Berry in digital institutional repository services has not been explored.

Understanding the role of repository managers has been found to influence the creation of an enabling environment which promotes utilization of repository services. In Botswana, Mooketsi (2020) and Tladi and Seretse (2018) utilized an interpretivist approach and the Engeström's Third Generation Activity theory to inform their investigation. Relying on

interview guides carried out to the university librarians, the findings established that the dockets required advocacy and reconsideration on the information capture and dissemination channels in order to improve accessibility to the services. In conclusion, user support services were found to possess a direct impact on the accessibility, usability and creating a friendly environment for post-graduate students. Training and customer care management programs were recommended as key remedial strategies for rejuvenating repository utilization and access. The study was however based on the librarian point of view unlike in this study which obtained opinions from both post-graduate students and head of section librarians. Other differences are, observable on the philosophical approaches and theories underpinning the study where, this research adopted the SERVQUAL model as a theoretical guideline to underpin the objectives of the study.

User support has also been identified as a success strategy for influencing the tangibility, accessibility and reliability of repository services among university libraries. Mooketsi (2020), Ogungbeni et al. (2018) and Utulu and Ngwenyama (2019) established that it was needful for university librarians to prioritize the needs of post-graduate students and staff in order to make their services more efficient, dependable and reliable. The descriptive studies which utilized interviews and questionnaires to understand the opinions of librarians regarding the same identified that repositories were underutilized because the research processes were weak, accessibility to the repository website was tough and that the materials were not well repackaged to meet the user needs. To overcome these challenges, training was recommended to be carried out to the staff in order to prioritize on what users want. In this study, opinions from both the users (post-graduate students) and

university head of section librarians were accommodated to understand the phenomena in a deeper point of view.

The usability, awareness, accessibility and nature of repository service providers significantly impacts on the efficiency and effectiveness of service delivery among institutional repositories. In Tanzania, South Africa and Nigeria, Kayungi et al. (2021), Akparobore and Omosekejimi (2020) and Bamigbola and Adetimirin (2017) did an evaluation of these factors through descriptive studies which adopted mixed methods approach. Qualitative and quantitative findings indicated that there were weaknesses which hindered the assess ability and usability of repository services. In order to overcome these loopholes, it was opined that the user community needed to be aware on copyright rights, creative common licenses, plagiarism, have good internet bandwidth and knowledge on how to access published materials. Librarians were called upon to conduct vigorous marketing and awareness through seminars, orientations, workshops and one-on one basis in order to achieve usability, awareness and accessibility to the deposited items. The current study aimed to utilize a model to determine its applicability in service delivery where reliability, responsiveness, tangibility, empathy and assurance constructs will be assessed.

There is exponential growth in adoption and utilization of digital institutional repositories in Kenyan university libraries. This is due to the need for universities to communicate scholarly to a wider community, achieve internationalization and preserve its intellectual output of archival value (Ratanya, 2017). Locally, literature covering the facets of the adoption of SERVQUAL model as opined by Parasuraman and Berry to determine service delivery among Kenyan university digital institutional repository is deplorable. Some descriptive studies by Ratanya (2017) and Achieng (2016) have investigated on the

accessibility and utilization of institutional repositories. They have revealed that among the strategies they employ to achieve usability of their digital platforms is by effecting their services through satisfying their user community. These studies have however reported underutilization of digital library services to be complicated by accessibility barriers, lack of resources, lack of knowledge, little managerial support, limited network, internet bandwidth and policies. The studies also inferred the existence of a relationship between efficiency, effectiveness, accessibility, awareness, satisfaction and the usability of repository services. Ratanya (2017) and Achieng (2016) recommended on the strengthening of leadership which is responsible for supporting libraries with finances, trainings, marketing and providing required resources for achieving improved utilization. Apart from the studies concentrating on the teaching staff members as users of the digital institutional repository, they also concentrated on the usability of the platforms. The current research believed that improving the reliability, responsiveness, tangibility, empathy and assurance of services improves service delivery among digital institutional repositories.

Kakai et al. (2018) and Mwiti (2017) focused on the factors which impact the utilization of institutional repositories. These were descriptive studies which were based on staff point of view. The questionnaire views implied that utilization of digital institutional repositories was hindered by little enthusiasm of librarians in creating awareness and presence of negative perception towards them. In order to iron this out, comprehensive advocacy program was deemed necessary to create awareness as well as alleviate the negative perception on plagiarism and copyright issues among the university population. Other strategies recommended by Kakai et al. (2019) and Mwiti (2017) were the need to implement policies, involve management and obtain ICT solutions for fostering utilization

of open access repositories. The current study focused on assessing the status of service delivery among digital institutional repositories through utilizing SERQUAL model (Parasuraman and Berry, 1988) parameters in Meru County. Other differences are on the engagement of post-graduate students as the target population for the research.

The premise of managing and upgrading digital institutional repositories with the changing user needs was acknowledged as a good parameter for maintaining service provision. Karanja (2017) and Njagi and Nmande (2018) investigated this aspect in Kirinyaga, Embu and Machakos Universities. The descriptive studies which used purposive sampling to obtain participating librarians among the universities focused on the current status quo of affairs since the adoption of digital institutional repositories. The studies established that policies were helpful in steering services and daily operations of the open access repositories. It was also noted that the dockets had qualified but inadequate staff, lacked resources and that the user community were less aware of the services offered in the repository. The studies recommended the university management to commit itself to improve repository services by increasing funding budget and also providing required resources to run the repositories. The current study investigated the influence of reliability, responsiveness, tangibility, empathy and assurance on service delivery among digital institutional repositories in Meru County.

In Meru County, MUST and KeMU acknowledge the impact digital institutional repositories play in showcasing university scholarly image. Irrespective of this, digital institutional service delivery is still not very satisfactory as there is evidence of little awareness and little usage of repository services offered (Mwiti, 2017). Mwiti (2017) concentrated on the factors which influence the utilization of open access repositories. This

study was of the view that reliability, responsiveness, tangibility, empathy and assurance of repository services influence service delivery among digital institutional repositories in Meru County.

2.3 Reliability and Digital Institutional Repository Serice Provision

The aspect of satisfying customers and make them develop loyalty to the services they are looking for is what service providers are on a daily basis striving to achieve. Post-graduate students are always on lookout for consistently unchanging and undiminishing quality of performance, services and deliverables in digital institutional repositories in their registered university libraries (Alam, 2021). Reliability of services provided in institutional repositories mean gradual winning of confidence and trust to utilize information resources, make inquiries, consultations, deposit their articles and receive guidance of any kind (Ahrar & Rahman, 2012). With the advancement in information communication technology, digital institutional repository services are majorly rendered virtually. Reliability of digital institutional repository services therefore, comply with the ability of services to remain trustworthy, readily available and accessible through simple accessing criteria without compromising the authenticity, usability and quality of the information (Alam, 2020). Services are reliable when there is long-term accessibility, when the service itself is dependably and associated with high level of accuracy (Alam & Mezbah-ul-Islam, 2021).

Reliability of digital institutional repository services is evidenced by comprehensiveness of the information services, appropriateness of the service, dependability of the service, availability in the needed format and perceived helpfulness (Lee & Hong, 2017; Alam, 2020). Reliability of digital institutional services is classified and associated with four aspects of quality; technical quality, functional quality, technological quality and general

corporate image of the department offering services (Hassain, 2016). Moreover, services are termed reliable when offered within the required time, when repackaged to meet the user needs, when consistent and sustainable over a period of time, when available in 24/7 basis and also when they depict accuracy feature-like (Lin et al., 2020).

Reliability of digital institutional repository services is attained by the adoption of relevant ICT infrastructure and software (Trivedi & Bhatt, 2019; Islam & Habiba, 2015). The adoption of free open source software like e-prints and D-space among digital institutional repositories permits the long-term preservation of scholarly output. Moreover, it allows multiple accessibility of similar resources by different people, remotly, timely and simultaneous service delivery (Lin et al., 2020; Aini et al., 2021). For this to be fruitful, digital institutional repository staff play a fundamental role of conducting trainings, creating awareness, campaigning and promoting open access platform in order to equip the university community with relevant skills and knowledge on how to access the repository services (Partab, 2019). Apart from that, the adoption of user focused mindsets by librarians has greatly stimulated the satisfaction of post-graduate needs hence, achieve their service dependability (Alam & Mezbah-ul-Islam, 2021). Moreover, the inputs of a supportive administration and management through financing, facilitating, supporting, advising and guiding on the same contributes towards having reliable services (Trivedi & Bhatt, 2019). Therefore, a combination of human, systems, software and university managerial efforts, make reliability of digital institutional repository services, a success.

Enhancing the reliability of services bears institutional repositories in university libraries numerous benefits. These range from development of confidence on the rendered services, earn trust, improved accessibility of services and meeting of the post-graduate information

needs (Peng et al., 2018; Lin et al., 2020). Other benefits associated with the won trustworthiness of digital institutional repository services include; the development of best practices for operating the repositories. Others are like, development of a sense of responsibility, improved transparency, efficiency, technological advancement, organizational performance, improved institutional image and branding and long term-preservation of information of enduring value (Donaldson, 2019; OECD, 2017).

However, the achievement of reliability of services among digital institutional repositories in university libraries has been termed to face a variety of drawbacks. Some of the impediments to reliable services range from irregular service quality assessment, ignorance of customer feedback and limited investments in technology (Partap, 2019). Others are in line with stiff competition from other service providers and information overflow in the internet (Leonard, 2018). Despite this, achievement of reliability of services provided to customers has been identified by Alam and Mezbah-ul-Islam (2021) to increase dependability, trustworthiness and accuracy.

In the developed countries, reliability of digital institutional repository services is anchored through various strategies and best practices. Lin et al. (2020) and Lee and Troung (2016) illustrated how trustworthiness of services could be won among digital repositories. The studies focused on user focus, transparency, responsibility and technology aspects. The findings opined a common framework constituting of a combination, had significance in underpinning trustworthiness of digital repository services. The framework was recommended to be improved through developing infrastructure, which will ensure readily availability of the information resources deposited in the digital platforms. Differences evident from the studies with the existing ongoing one, is that, in this research the

SERVQAUL model developed by Parasuraman and Berry (1988) was utilized to determine its applicability on service provision among digital institutional repositories in Meru County.

Alam and Mezbah-ul-Islam (2021), HeryWihardikaGriadhi (2018), Alam and Mezbah-Ul-Islam (2019) focused on service quality among public, academic and special libraries in Bangladesh. They identified the SERVQUAL model characteristics; reliability, responsiveness, tangibility and empathy and examined their influences on service delivery as articulated by the Parasuraman and Berry, modest. The data reported from the questionnaire and interviews indicated that SERVQUAL model was an efficient tool for determining the quality of service delivery among these institutions. Findings indicated that users were satisfied with the nature of services, the administrators who attended to them and also the mode of delivery of services. Moreover, a comparison of the four components indicated that reliability was the most influential factors when it comes to service delivery. Recommendations articulated regular conduct of surveys in order to identify areas requiring improvement. In congruence, the current research adopted the same model to validate service delivery. However, unlike Alam and Mezbah-ul-Islam (2021), HeryWihardikaGriadhi (2018), Alam and Mezbah-Ul-Islam (2019) who investigated broadly considering all departments within public, academic and special libraries, this study differed in scope since reliability was investigated with respect to digital institutional repository in academic libraries in Meru county. Consequently, the findings reported that assurance aspect was weighty unlike these studies which identified reliability as weighty among the model constructs.

Technology has been classified as a great enabler in enhancing the reliability of digital institutional repository services. In Minesota, Digby (2021) and Mugridge and Waterhouse (2023) elaborated this aspect focusing on the influence of applying technology in delivery and carrying out library operations. The mixed methods studies which utilized surveys to obtain data focused on purported usefulness, ease of use, need, cost effectiveness, and reliability aspects influencing the adoption of digital institutional repository software. Reported findings inferred that, factors including; perceived need, reliability, and perceived usefulness of an institutional repository system were important considerations when deploying a technology which was in line with the adopted theory; the technology acceptance model (TAM) model. Library administrators were called upon to enhance reliability, usefulness and meet the needs of the community through deploying technology which accommodated all these. These studies were concerned about the factors ought considering for a good service delivery technology, the current study assessed the status of reliability of digital institutional repositories. Moreover, questionnaires and interview guides were incorporated to better investigate the scenario through in depth data. This study also utilized the SERVQUAL model to underpin the constructs of the study.

The successful achievement of a reliable service design require the analysis and centering of the customer needs. This was well articulated in the studies carried out by González-Pérez et al. (2021) and Barrueco Cruz et al. (2021) in Spain and Mexico. Specifically, the researchers investigated the influence of a user-centered design on improving repository services. In consideration, learner's perceptions, preferences and wants concerning the find ability of repository site, browse ability, search engines and user interface design were interrogated. Depending on focused group discussions and surveys conducted to the

respondents of the studies, results implied that learners were less aware of the repository and also the services being rendered therein. Consequently, customer needs were identified as key in ensuring satisfaction in service delivery. Apart from that, students preferred easily navigable user interfaces which permitted easy browse ability. It was also reported that these features enhanced information find ability and navigation hence reliable. Recommendation stipulated the need to create awareness on the services available among repositories.

In the developing countries, literature accessing on the influence of reliability on digital institutional repository services is gradually taking roots. Some studies such as Eje (2018), Ogar and Dushu (2018), Achieng (2016), Bruce and Baloyi (2018) and Anaso et al. (2018) exist. In Nigeria, Zambia, Kenya and South Africa, reliability of digital institutional repositories has been enhanced through the adoption of information communication technologies (Anaso et al., 2018; Ganaie, 2019). Apart from that, the adoption of SERVQUL model characteristics to determine the quality of digital institutional repository service delivery is at a very infant stage and henceforth unexplored.

Featuring studies by Anaso et al. (2018) and Ganaie (2019) have investigated the influence of ICT infrastructure on institutional repository service delivery. These comparative studies analyzed how ICTs influenced service delivery. It was reported that a statistical significant relationship existed between improved service delivery and utilization of technological infrastructure. Moreover, ICT technologies were found to be little exploited by the university faculty. Recommendations for improving usability of technologies was recommended following the positive benefits that were reported as a result. The current

study specifically determined the state of reliability aspect in digital institutional repository service delivery other than the statistical influence at universities in Meru County.

In South Africa, the usability of digital institutional repositories was investigated. The studies by Dlamini (2016) and Saulus (2017) focused on the perceived usefulness of services by staff ad post-graduate students. It was identified that both staff and post-graduate respondents underutilized the repository services. Underpinned by the technology acceptance and SERVQUAL models in the studies, the intentions to utilize the services was hindered by efforts, performance and facilitating condition expectancies. Little awareness was also reported which was opined to be majorly contributed by lack of training, limited time, lack of knowledge, preference for other web sources, and lack of skills, slow internet, and preference for reputable journals. Furthermore, it was established that librarian's promotional strategies were inadequate and hence forth, the study which employed a positivist philosophy recommended the adoption of library workshops, seminars and outreach programs to familiarize post-graduate students on the usefulness of digital institutional repositories. However, the aspects of reliability of institutional services did not come out with clarity. This study was determined to clarify on the same by investigating, the, extend of reliability on service delivery among digital institutional repositories in Meru County. Moreover, the study adopted a pragmatism philosophy to articulate the methodology of the study.

The competencies of librarians has been identified as a critical factor in influencing the manner and delivery of services. In Nigeria for example, librarian's competencies and knowledge were evaluated with response to the quality of service delivery. This was reflected in the research conducted by Salam et al. (2018) and Eje (2018). A research

population which targeted librarians was concerned about their level of competency and the hindrances they faced in course of conducting their daily business in the academic libraries. It was established that librarians were not performing well when delivering electronic services since they had inadequate training and skills. Because of that reason, the introduction of ICTs was found to cause about poor service delivery due to the skills gap. Recommendations were articulated which had implications on funding in order to impact them with relevant skills and competencies required for meeting the customers technological changing needs. The previous studies however, failed to link the aspect of librarian competencies with the dependability aspects, a gap which the current study was determined to fill. Moreover, other existing differences are on the population engaged, this current research involved the post-graduate learners and head of section librarians in digital institutional repositories.

In Kenya, similar characteristics exhibited in the African nations are dominant, characterized by; lack of studies determining the status of reliability of digital institutional repository services among post-graduate students. Apart from that, the adoption of SERVQUAL model (Parasuraman and Berry, 1988) variables is at its infant stage and few existing research exist, which have incorporated this aspect by underpinning the model as a guiding theory for facilitating the methodology of their studies. Existing literature presented by Ratanya (2017) and Achieng (2016) have featured the aspect of usability and accessibility of digital institutional repository services in Egerton and the University of Nairobi repositories. A survey carried out among 84 staff and 200 students respectively established that the population is less aware of what is offered in the repository and that there are many hindrances experienced when navigating the platforms. Specifically,

hindrances of poor internet connection, limited staff support, managerial support, copyright issues and dismal collection available are dominant. It was established that, deployment of necessary resources was needful in order to establish much utility and usefulness of the university repositories. The current study linked the purposed usefulness and accessibility of Meru county university institutional repositories with the reliability aspect as presented in the SERVQUAL model of Parasuraman and Berry.

In Meru County, a study exist (Miti, 2017) which underpinned the factors influencing the utilization of digital repositories. Mwiti (2017) reported that, digital institutional service delivery is still not very satisfactory as evidenced by little awareness and little usage of repository services offered. This study was of the view that reliability of repository services may improve service delivery among digital institutional repositories in Meru County.

2.4 Responsiveness and Digital Institutional Repository Serice Provision

In digital institutional repositories, responsiveness of service providers and the systems present for rendering services matter if there is to be successful delivery and satisfaction of customer needs. This is in agreement with the notion that, human resources are key drivers in influencing regular accessibility, usability and revisiting of cite, offices and organizations by customers looking for solutions to their needs (Rozum & Thoms, 2016; Psoma, 2020).   Therefore, good preparations need to be done to the repository administrators in terms of their competencies, skills, customer care characteristics and how they handle customer feedback. The same has to be observed when they attend to customer, how they make referrals and how long they take to avail the user focused or repackaged service in institutional repositories (Saulua, 2017). It is also needful that academic librarians take interest and caution of guarding customer previous experiences, their

40

perception of quality, how they meet user needs and how long they take to act either virtual or physically.

Responsiveness is a term which is practically adopted to explain the aspect of being timely, prompt and willing to help or attend to a customer (Jain, 2020; Psoma, 2020). It is the ability of a service provider to act with urgency with respect to the need presented by a customer. In digital institutional repositories, responsiveness is felt when a repository manager or administrator takes the shortest time possible to guide, give feedback, respond and listen to user's needs and meet them satisfactory. Psoma (2020) and Janse van Vuren (2022) clearly elaborates that responsiveness, is the association of feeling prioritized, feeling important by being promptly attended to, within the shortest time possible while also feeling that your expectations are met in a continuous basis. Therefore, digital institutional service providers and services are responsive if, on regular or continuous basis, the repository user perceives promptness, quickness, readily availability of service providers, regular helpfulness and timeliness when being served at each given time (Saulus, 2017).

Perceived responsiveness among digital institutional repositories earns university libraries a number of benefits. One being the ability to win customer loyalty (Jain, 2020; Janse van Vuren, 2022). Apart from that, it enables the organization to maintain potential repository users and meeting their needs satisfactory. Other benefits are; improve operational efficiency, improved institutional image and branding, earn organizational performance, improve quality service delivery, manage monitoring and evaluation through customer feedback of the services on offer and also development perceived usefulness (Satpathy, 2017). Other benefits that come about by developing responsiveness in digital institutional

repositories are likened to; improved reliability and validity of library services (Trivedi & Bhatt, 2019; Jain, 2020).

In digital institutional repositories, responsiveness is indicated by characteristics such as the customer is made aware of the services on offer. When requested service is offered promptly and in a timely manner, the repository may also be classified as responsive. Moreover, availability of a staff who is very willing to guide or help and a perception that the employee is never busy to serve a user, also imply responsiveness (Trivedi & Bhatt, 2019). Tangibly, when the digital institutional repository services are responsive, customers are addressed politely and eloquently. Being responsive also mean there should be a platform where unsatisfied users can record complains in a book, a complain box or through an email (Satpathy, 2017). Consequently, it may be indicated by continuous build-up of a positive a perception that the library responded satisfactory to all the questions a customer had (Janse van Vuren, 2022).

Globally, research exist which has underscored the importance of being responsive to customers among university libraries departments. In the United States of America, Joo et al. (2019) identified the critical factors which improved responsive service delivery among institutional repositories. The researchers majored on user needs, ethical concerns, technological needs and metadata management. Surveys were conducted across several targeted libraries and the data informed that in America, institutional repositories needed to lay down adequate number of staff who will attend to the users. Moreover, administrative support was deemed necessary to guide on the expected code of conduct among staff, communication, feedback giving and satisfying customer needs. Conclusively, it was agreed that these aspects enhanced quick responsiveness, attracted

loyalty of customers and hence increased the accessibility of digital services. Apart from that, challenges were reported that in these repositories, service delivery was being hindered by limited funding, staff inadequacy and information security threats. In support with this study, the current research also determined the influence of responsiveness on digital institutional repository services at universities, in Meru County. Moreover, currently, interview guides and questionnaires were adopted to gather in-depth insights for informing the construct constructively.

Closely related studies in the USA articulated apathy, ignorance and creating awareness as important measures for influencing international usage of digital institutional repositories. Fralinger and Bull (2012) and González-Pérez (2021) ascertained these among institutional repository administrators through conducting surveys and focused group discussions. The gathered data upon classification and computation reflected that majority of libraries did not have a report on international usage statistics. Apart from that, creation of awareness on the available services was established to cause a lot of impact on the usability of the repository services. Moreover, ignorance and apathy by the administrators were acknowledged as great drawbacks for hindering the usability of digital institutional repository resources by the user community. Recommendations pointed out the need to create awareness in order to win usability, accessibility and awareness of available resources preserved in the digital repositories. For González-Pérez (2021) the research outlined a need for specific awareness creation criteria such as conducting training, organizing conferences, workshops and seminars for awareness creation. The current study did not only consider the input of digital institutional repository administrators but also the

consumers of the services; post-graduate students to determine the role of responsiveness on the improvement of service delivery among universities in Meru County.

The influence of adopting technologies in institutional repositories service accessibility, reliability and availability was examined. Digby (2021) and González-Pérez (2021) examined the needfulness of implementing technological requirements in informing usability and prioritizing the needs of customers. For González-Pérez (2021), it was identified that, prioritizing consumer design or prioritizing their needs was an important parameter for improving utilization of services while Digby (2021) ascertained that adopting technologies was a profound idea for influencing repository reliability and accessibility. Both studies reported that users knew little about the function abilities of these services and henceforth there was need to establish guidelines, training and navigation brochures to improve platform usability, accessibility and reliability. This study was concerned about the responsiveness and quality service delivery among digital institutional repositories.

Once the quest for attaining responsiveness in service delivery is required, the perceptions, views and expectations of customers need to be put in place. Trivedi and Bhatt (2019) were specifically interested in underpinning this in their study. Comparably, to the current study which adopts the SERVQUAL model, the same was employed to gauge the expectations and responses of library users in India. Concerning the attributes on responsiveness, it was underscored that the library did not meet the expectations of the users. It was recommended that the library needed to improve in meeting the expectations of its customers not only by being responsive but also by making the available services tangible. In this study,

differences exist from the previously carried out research, in that, it specifically addressed the docket for digital institutional repository in universities in Meru County.

Enhancing responsiveness in service delivery is appreciated among African countries despite the limited research carried out to investigate the same. Fagbohun et al. (2020) and Adebayo et al. (2019) investigated the influence of library service responsiveness in enhancing and promoting service delivery in Nigeria. Delving on general library services and e-resources provision, the facets of a responsive web site, federated search tools and information retrieval systems were investigated. It was identified that, the design of library websites informed the user about the services available in the site. Therefore, quick links, guiding procedures, easy navigation and flexibility attracted information seekers to find interest in exploring available resources. It was established that, responsiveness of the adopted ICT technologies was a significant factors for attaining the quality of service delivery among the libraries. Although the studies were based on general library services, it addresses a lot of strengths in terms of elaborating the existing relationship between responsiveness and quality service provision. The current study determined the state of responsiveness among digital institutional repository service provision at universities in Meru County.

The competencies of librarians has been identified as a prerequisite in the delivery of services. This was discussed by Salam et al. (2018) in their study which majored in the sources of acquiring training, knowledge sharing and the influence of competencies in service delivery. The descriptive study which purposely selected university librarians for interviews informed that the traditional competencies for offering manual services were dominant among librarians and that the adoption of technology rendered them ineffective

in service delivery. Apart from that, there were no evidences of ongoing trainings to fill the gap in existent. Trainings, workshops and funding were acknowledged as fundamental remedies for revamping the situation. In conclusion a statistical significant relationship between competencies and service provision was established. The current study assessed the status of responsiveness and applicability of this variable in digital service provision at university libraries in Meru County.

Imbibing the principles of efficient customer service among libraries was identified as a strategic tool for achieving library pro-activeness, responsiveness and efficiency. Isibor et al. (2016) and Goshie et al. (2018) factored this in, in their research by undertaking critical investigation on the change in technology, responsiveness and dynamism in the current information seeking behavior of library patrons. Systematic review designs were employed where analytical approaches were adopted to inform the scenario concerning the radical changes comforting service provision. It was opined that service provision was being transformed by customer changing needs and adopted technologies. Moreover, these changes were also influencing the library budget and financial allocation. The findings also shed light that focusing of customer needs like promptness, politeness, professionalism, attentiveness, reliability and deploying necessary technology projected the attainment of responsiveness and efficiency. Recommendations commissioned the need to fund libraries with necessary resources. The studies however focused on general academic libraries a situation which uniquely creates a difference to the current one which took place among digital institutional repositories. Other differences are on the adopted methodology whereby the current study obtained primary qualitative and quantitative data to inform the status of responsiveness and service delivery.

A chapter preview by Adeyeye (2023) in Nigeria traded on related aspects as those by Isibor et al. (2016) and Goshie et al. (2018). In response to the vein of customer satisfaction, librarians explained the necessary facets that were worth considering in order to attain reliability, responsiveness and relevance special library services. They established that customer care principles such promptness, politeness, empathy and professionalism contributed towards achieving customer satisfaction. This study established the applicability of responsiveness on the delivery of digital institutional repository services at university libraries in Meru County.

Here in Kenya, customer care and patron satisfaction is a quality that has been considered worthy building in order to achieve efficiency and effectiveness in service provision. It is also worth noting that there is a serious literature dearth of this phenomena under investigation. The available studies for instance, Kakai et al. (2018), Mwiti (2017), Karanja (2017) and Njagi and Nmande (2018) have investigated issues on institutional repositories in Kenya. The major facets they dissected in were: the factors influencing the utilization of online repositories and the current state of affairs regarding the sections. All studies utilized descriptive survey research designs, were university staff oriented and engaged these primary respondents through questionnaires and others incorporated interview guides. For Karanja (2017) and Njagi and Nmande (2018) studies, it was underpinned that policies were helpful in steering services and daily operations of the open access repositories. However, the current state of repositories was characterized by inadequate staff, limited resources and dismal user awareness of the services offered in the repository. While Kakai et al. (2018), Mwiti (2017) as well established common hindrances to service delivery. Recommendations pointed on resolving to adopt comprehensive advocacy programs and

creating awareness to alleviate the negative perception on plagiarism and copyright issues among the university population. Other strategies recommended by Kakai et al. (2019) and Mwiti (2017) were the need to implement policies and involve management to obtain ICT solutions which foster utilization of open access repositories. The current study focused on assessing the status of responsiveness of digital institutional repositories in Meru County. Other differences are on the engagement of post-graduate students as the target population for the research.

2.5 Tangibility and Digital Institutional Repository Service Provision

Tangibility of institutional repositories is explained by the appearance of the human resources, available physical facilities, equipment, infrastructure, technology, furniture and information resources (Psoma, 2020). According to Saulus (2017), tangibles assimilates to the repositories physical environment constituting of the facilities, equipment, communication materials, information resources, personnel's conduct, ethics and dress code. In the repository section, one may identify the tangibility of the docket by seeing a neat office, well arranged resources, well locked storage cabinets, a professional staff manning the section and also computers and ICT technologies (Parasuraman et al., 1985).

Tangibles in digital institutional repositories are characterized by the presence of a neat staff in appearance, modern fitted furniture and equipment (Saulus, 2017). It is also characterized by visually appealing physical facilities, service pamphlets, user guides and brochures that are neatly arranged (Al Mahameed et al., 2021). Apart from that, tangibles may also be identified among the electronic services available. These will constitute of an easily navigable institutional repository website and visually attractive arrangement of the contents on the repository website. Others are, quick links which are effectively working,

48

good appearance and coloring of the repository page, well organized downloadable documents and easily accessible user guides (Roy, 2021; Saulus, 2017).

Having tangibles has some espoused benefits in digital institutional repositories. Tangibility of digital repositories achieve visual impression, save time for information search and retrieval and accessibility to information (Kumar Roy et al., 2022). For this reason therefore, tangibles are set to enhance the achievement of satisfaction of repository patrons. They are also responsible for, improving the institution reputation, scholarly visibility and preservation of information with enduring value (Ibrahim et al., 2022). While tangibles in a repository may be beneficial, their inadequacy may be a major hindrance to effective service delivery (Digby, 2021). This is because physical facilities, human resources, infrastructure, information resources, material and immaterial resources' existence determine the successful rendering of services. Therefore, it is extremely needful to examine the status of tangibility of digital institutional repositories at universities in Meru County.

In North America, Luther (2018) and Sterman (2014) investigated how repositories were advanced in line with adoption of ICTs, hardware and software solutions. Focusing on the advancement in technology, it was discovered that ICT adoption reshaped how services were offered among libraries. They eased the accessibility, improved proximity and saved time of the users. Apart from that, these technologies facilitated the dissemination and repackaging of information which in the long run enhanced user satisfaction. It was recommended that technologies were an important vehicle for reaching both local and global population hence encouraged achievement of international usage of the library

services. The current study was concerned about investigating the tangibility of services across repositories situated in Meru County.

In America, and the United Kingdom, Callicot et al. (2015) and Arlitsch and Grant (2018) clarified that human resources, fiscal resources and material resources were important enablers for improving service provision and rendering. Apart from having so many repositories, it was clarified that service provision could be enhanced by undertaking proper planning. It could also be enhanced through, deploying resources and allocating required resources as a means of preparing the environment. The studies established that infrastructural development was significant in underpinning quality service delivery. For this reason, Callicot et al. (2015) and Arlitsch and Grant (2018) stressed the need to allocate more finances to ensure smooth operating environment among institutional repositories. In congruence, this study assessed on these facets to improve service delivery to post-graduate students at universities in Meru County.

Communication role of repository administrators has been suggested to play a fundamental role in qualifying, service delivery among developed nations. Cox (2016) investigated this aspect as a means of ensuring the creation of awareness and earn of digital scholarship. The study called upon librarians to broadcast the services on offer in order to earn partners, customers and digital scholarships. The study suggested the design of interactive websites, funding of workshops, conduct of user surveys, and documentation of user guides. These were common methods for enhancing the publicity of libraries. Other dominant models were the enactment of open access initiatives, good practices and publishing of institutional repository platform reforms (Callicot et al., 2015). This study examined the status and applicability of tangibility in digital repository service provision.

Dilemmas on repository service delivery in Asian countries have been reported. Bandyopadhyay and Boyd-Byrnes (2016) and Lagzian et al. (2015) focused on the challenges which hinder service delivery among institutional repositories. Some of the common challenges featured in the studies were difficult in navigating and accessing the sites. Other difficulties experienced were; limited awareness of services by scholars on among the repositories. This was associated to lack of knowledge, limited marketing strategies, limited policies and dismal infrastructure. Outlined efforts for remedying the situation were explained to constitute investment on building the services through marketing. Moreover, others were, repository products' painting, effecting frameworks mandating deposition, assurance of technical, technological, maintenance and metadata support services.

Effective revamping of repository services through the adoption of comprehensive frameworks was stocked as good mirage for realizing tangibility of services among libraries. In response to this, Atkinson (2019) and Cox (2016) exposed the role of adopting policies for running digital institutional repositories. It was reported that these policies addressed important facets on repository administration and user trainings, which to a large extent; contribute to quality of service delivery. These studies were however generalizable to service delivery, the current study determined tangibility in digital institutional repository service delivery.

Regionally, there are no studies detailing on the influence of tangibles on digital institutional repository service provision. A handful studies existing feature on, service provision among libraries. In Ghana, Baada et al. (2020) established the influence of resource constraints similar to Agyemang (2017) and Mugwisi et al. (2018). The

researchers supported that the quantum and availability of resources was extremely important in determining the quality of service provision in libraries. However, the challenges that were dominant amongst these libraries was the unavailability of some resources, inadequacy of facilities and also limited personnel. Others were, physical resources and nature of library materials which ultimately resulted in low patronage of the library facilities. A statutory recommendation on resource allocation was deemed a necessity if service provision was to be done satisfactory. These studies opine a lot of strengths on the role of resources in influencing service delivery. The current study opted to determine the status of the same in digital institutional repositories in universities in Meru County.

The situation in Nigeria and Zambia is not in any way different. Salman (2017), Salma et al. (2018) and Salman et al. (2017) explored this disparity concerning the issues of challenges in service provision. All studies employed mixed methods approaches and data triangulation tools. Results found reflected that, service provision was let down by; inadequate funding, insufficient staff, irregular electricity supply, outdated library materials, lack of functional library resources, facilities and inappropriate public library legislation. However it was recorded that there were no efforts underway put in place to remedy the situation. A funding model and transformational leadership administration was called upon to revamp the situation. This study acknowledged that tangibles have impact on the delivery of digital institutional repository services at universities in Meru County.

The extent at which repositories embrace technology was termed to influence service delivery among libraries. Khumalo and Baloyi (2018) and Antasari et al. (2021) reports featured this parameter explaining that the availability of websites, internet, social network

platforms, finances and human resources improved service delivery. Despite this, Khumalo and Baloyi (2018) and Antasari et al. (2021) found that available ICT infrastructures was not fully exploited and henceforth online service delivery was limited. It was stressed that adopting ICTs in all sectors was important in fostering service provision.

Locally, there is a serious dearth of literature discussing this phenomena under investigation. Present literature by Ratanya (2017), Achieng (2016), Kakai et al. (2018), Mwiti (2017), Karanja (2017) and Njagi and Nmande (2018) have presented that institutional repository service delivery has numerous benefits although the sector is suffering a lot of challenges comparably to the other countries in Africa. Some of the mechanisms that have been put in place to take care of the observable loopholes in service among repositories is adopting technological infrastructure, creating of awareness, funding and also investing in the competencies of the employees (Ratanya, 2017; Achieng, 2016; Kakai et al., 2018).

The current study has noted lack of sufficient literature addressing the aspects of tangibility and its influence on repository service delivery. Instead, previous scholars focus on the challenges and utilization of digital institutional repository services. Karanja (2017) and Njagi and Nmande (2018) investigated the care of user needs, perceptions and attitudes in service provision. The responses from librarians opined that, caring for and operating in response to the changes on user needs was a good parameter for improving service provision. However, this was established to be made possible if comprehensive policies were set apart and implemented to steer change management.

Njagi and Nmande (2018) and Achieng (2016) closer to the current study objectives also stressed the need for information resources, physical infrastructure and facilities to support

service provision. Njagi and Nmande (2018) and Achieng (2016) reported inadequate staff, lack of resources, limited internet bandwidth, limited policies and less awareness among users were common hindrances to using the repository. The studies recommended the university management to commit itself to improve repository services by allocating more funds and also providing required resources to run the repositories. Apart from that, the studies inferred the existence of a relationship between efficiency, effectiveness, accessibility, awareness, satisfaction and the usability of repository services. Similarly, Ratanya (2017) investigated and reported common aspects on the challenges dominant in Egerton University institutional repository. Ratanya (2017) reported underutilization of digital library services due to accessibility barriers, lack of resources, lack of knowledge, little managerial support, limited network and internet bandwidth. The scholar recommended the improvement of the visibility of services through leadership support. The current research ascertained that improving the tangibles in digital institutional repositories improves service delivery in digital institutional repositories.

2.6 Empathy and Digital Institutional Repository Serice Provision

Empathy is a term expressed by caring, loving and embracing attitudes either verbally or non-verbally by an employee towards a customer (Psoma, 2020). Empathy can be explained in two different ways. This way, where, the customer feels a sense of security, love, care, acknowledged, given attention and respected throughout the time when conversing, being guided or being served (Parasuraman et al., 1985). The other way is; services being accessible remotely, how quickly the repository can bring results and also readily availability of services in twenty four clock basis (Leading Effective Staff, 2023). In the context of digital institutional repository service provision therefore, empathy will

be defined as the perceived usefulness of repository services as a result of allowing virtual access, multiple access and feeling a sense of belonging, cared for, loved, at home and also comfortable when interacting with the repository staff (Psoma, 2020). Saulus (2017) explain empathy to constitute a combination of ease of accessibility, coupled with clear communication and understanding the customer so well.

According to Zavvy (2022), empathy may be categorized into; cognitive, emotional and compassionate. Cognitive empathy is concerned about understanding how an individual mind works, functions, perceives and reasons. This means that you understand the perspective of the client rationally or irrationally. Emotional empathy is a form of empathy which is concerned about understanding the feelings and affection of the client. Lastly, compassionate goes a long way to share the emotions of the customer by showing concern and also taking a step aimed at addressing the situation or finding a solution to the troubling problem (Baeupre, 2023). In digital institutional repositories, the administrators in charge of service provision ought to demonstrate a combination of all the three forms of empathy by being compassionate, emotional and cognizant.

According to Parasuraman et al. (1985) and Saulus (2017), empathy constituents exist when an administrator in the repository pays attention to the patron by listening. It is also demonstrated when services are opened at hours convenient for all customers. Moreover, if each customer perceives individual attention, company language keeps customer's interest at heart and their needs are both understood and met satisfactory, they classify the service to have empathy. On the facet of digital institutional repositories, empathy is perceived when the e-resources are accessible remotely (Psoma, 2020). It may also be expressed by navigable websites, downloadable documents and system notifications to

patron when new journal articles or theses published. Also, if the system memory is able to retrieve clients past documents based on the searchers, it is classified as empathetic (Psoma, 2020).

Empathy in digital institutional repositories may be developed through an empathetic institutional culture, positive organizational culture and good leadership (Heckaman, 2022). It may also be stimulated by internal communication systems, prioritizing user needs and through am employer winning the employees loyalty and trust (Heckaman, 2022). Empathetic leadership exercised by the university librarian also provides a bedrock for the development of empathetic employees (Heckaman, 2022). Empathy is better expressed when the client or repository patron note secretly that the staff attending to them understands people, cares for their needs, prioritizes customers happiness, understands feelings, thoughts and attitudes (Leading Effective Staff, 2023).

In university libraries, employed staff can show empathy to clients who need their attention. This is by watching their language, their signs of burnouts and increasing interest in listening to them. Also, they can do so by, giving hope to discouraged clients, demonstrate willingness to help, show compassion for any pain, loss or suffering and having good listening and communication skills (Leading Effective Staff, 2023). Notwithstanding, empathy can be expressed though verbal and non-verbal cues of communication (Saulus, 2017). Furthermore, accessibility of services and knowing what customers need and want, henceforth, also demonstrates empathy. It is important for repository managers to manage their non-verbal expressions when handling temperamental, frustrated or disturbing customers.

Expressing empathy when handling information seekers in digital institutional repositories is beneficial to both individual and the institution. Some benefits such as organizational performance, attaining emotional intelligence, attaining effective leadership, user needs satisfaction and improved organizational corporate image are attained (Ranchordás, 2021; Impactly, 2022). Other benefits associated with expression of empathy among institutional repository is the development of communication skills (Zavvy, 2022). Being empathetic in the work place has been associated with promotion of inclusiveness, equity and impartiality to unique groups such as the ones with disabilities, the superiors and the underrepresented minorities in the society (Ranchordás, 2021). Empathy furthermore, improves customer experience, cultural awareness, innovative thinking and leadership skills (Zavvy, 2022). Despite this, developing empathy is associated with a number of challenges which include; it takes time, effort and always prioritizing on how others will feel apart from yourself (Impactly, 2022).

Globally, embracing and demonstrating empathy among digital institutional repositories among university libraries has been recognized as a key strategy for attaining organizational performance, meeting user needs and building institutional image. This had been demonstrated in a number of studies factoring in the adoption of SERVQUAL model (Parasuraman and Berry, 1988) constructs to assess service provision among libraries. Some of the efforts that have been channeled to foster the expression of empathy among employees include trainings on customer care handling and empathetic leadership influence (Maness et al., 2008). Other techniques that have been adopted to incorporate empathy when handling customers is through the enactment of ethical and codes of conduct policies (Zaugg & Ziegenfuss, 2018).

Empathy was reported to influence the understanding of customer's needs. This notion was demonstrated in the report of Zaugg and Ziegenfuss (2018) and Maness et al. (2008). The studies uncovered that being compassionate with users provided a conducive avenue for them to share their preferences, wants, needs and observations concerning the types of information resources they needed and in what format. Moreover, clients could open up by explaining the reasons why users lacked cooperation in depositing their scholarly output in the digital repositories. It was concluded that staff behavior possess some significant influence on consumer behavior. It was recommended that when developing a repository, it was needful to incorporate the learners and clients who will speak out their preferences and wants. Similarly, the current study assessed the status of this construct's on digital repository service provision at university libraries in Meru County.

Empathy was classified as a determinant factor for attaining electronic service excellence. This was exposed by Psoma (2020) in Europe who utilized the five variables prescribed in the SERVQUAL model by Parasuraman and Berry to measure the excellence of e-service delivery among travel agencies. Concerning empathy, Psoma investigated on the influence of caring, attitudes, listening and granting individual attention. The research exposed that, empathy characteristics-like, possessed very high positive impression towards service satisfaction and the development of customer loyalty. Specifically, empathy among the e-services that were available was expressed through the ability of the websites to serve a big number of people at the same time and also the readily availability of the customer care operator on a twenty four hour regular basis (Psoma, 2020). The study recommended this soft skill virtue to be cultivated among employees and even the online travelling system in order to win trust, security, loyalty and preferences from the customers. This study outlines

a lot of valuable knowledge for guiding the current research. Moreover, the ongoing study was based in university library institutional repositories and also engaged the post-graduate students.

Formulating empathetic policies that focus on customers' needs were categorized as key determinants for meeting user needs and wants. In Swaziland, Saulus (2017) compared the usability of repository services among faculty and post-graduate students using the SERVQUAL model. On the aspects of empathy, the study validated the applicability of SERVQUAL constructs as given by Parasuraman and Berry in 1988. It was informed that, regular service quality assessments and conducting usability studies were important points of consideration for guiding the understanding of users' service and technology needs. Recommendations stipulated the need to incorporate users as priorities, by surveying them. The current study underscored the status of empathy on digital institutional repository service provision at universities in Meru County.

Service quality was assessed in Bangladesh as reported by Alan and Mezbah-ul-Islam (2020), Afridi (2016) and Alam (2018). Surveys were conducted in order to ascertain the tolerance levels of service expectation, performance and desired outcomes. Quality service delivery was validated with the input of the five constructs of the SERVQUAL model (Parasuraman & Berry, 1988; Podbrežnik, 2014). The results claimed that, the level of clients satisfaction was reasonably well and that all the five dimensions for measuring service delivery were adequate enough. In a similar notion, Ojo and Nina (2020) in Ireland, established the applicability of SERQUAL constructs in promoting service delivery among health industry and discovered that the model possessed a lot of potential of identifying and exposing service gaps. Specifically, it was established that nurses communication

methods, listening abilities and caring nature influence the quality of service delivery. Although the study was based in healthcare organizations, the influence of empathy was a predominant influence on the quality of nurses' service delivery. The current study determined the state of empathy on the delivery of digital institutional repository services to post-graduate students in Meru County.

User focus is a determinant factor for earning digital institutional repository trustworthiness. Lin et al. (2020) incorporated views from repository administrators on the effective guiding principles for securing trustworthiness among these library sections. One of them was concentrating on user focus. It was established that giving priority to the potential users targeted to utilize and assess services among these repositories possessed a positive impact on the trustworthiness, quality, responsiveness and usability of information materials published. User-centered priorities were recommended to be enhanced in order to earn the growth and development of a reputable repository. However, the specific ways of implementing user-centered methods in service delivery were not enlisted. The current study focused on empathy and digital institutional repository service provision among university libraries.

Regionally, the place of employing empathetic principles among library service points stands out. Apart from that, the utilization of SERVQUAL model constructs (Podbrežnik, 2014) particularly on empathy, in underpinning digital institutional repository services has not been explored.

In South Africa, Frahm-Arp et al. (2021) and Semo and Frissa (2020) explored the impact of empathetic leadership on the well-being of employees working in the university of Johannesburg library department during the COVID-19 season. The semi-structured

interviews and surveys carried out revealed that the librarians were heavily laden with frustrations, felt overwhelmed, and anxious. Apart from that, the employees were also courageous and felt motivated under the influence of the empathic leadership demonstrated by the university librarian. Specifically, the acts of kindness, compassion, listening skills and also prioritizing employee's needs at the center were reported to possess greater influence on satisfaction level, comfort and motivation of the employees. The studies concluded the existence of a significance relationship between empathy aspects and the well-being, motivation and satisfaction of library employees in South Africa. These studies possesses a lot of similarities to the objective of the current study. Specifically, the current research determined the empathy of digital institutional repository service provision to post-graduate students rather than the library staff themselves at universities in Meru County.

Empathy has been classified as an important determinant factor for attaining responsiveness and earning customer loyalty. Adeyeye (2023), Isibor et al. (2016) and Goshie et al. (2018) in Nigeria traded on this aspect with the view of meeting clients' needs satisfactory. The samples of respondents was obtained from special, public and academic library employees. Interview and survey data was collected on matters covering reliability, responsiveness and empathy. The study found that a combination of promptness, politeness, eloquence when speaking, professionalism, high level of competence, administration of services using ICTs and readily availability of customer care services improved the level of customer satisfaction. Recommendations pointed on the need for developing long-term customer care management by adopting trainings, funding models and the code of conducts. The studies were based on private, public and special libraries,

the current research was carried out in academic libraries. Moreover, the current research differs from the previous ones with respect to the target population. This study engaged the post-graduate students in addition to determine empathy in digital institutional repository services in Meru County.

The adoption of appropriate technologies and ICT infrastructure has been termed as an influencer for empathy in e-service delivery. Fagbohun et al. (2020) and Adebayo et al. (2019) delved on this area by probing the application ICTs in Nigerian libraries. Important aspects on electronic resources delivery was investigated using descriptive survey research design. The laid findings informed that the presence of a responsive web site, federated search tools and information retrieval systems were important determinants for improving promptness and time saving in service delivery. It was also identified that, the design of library websites informed the users about the services available in the site, hence quick links, guiding procedures, easy navigation and flexibility attracted information seekers to find interest in exploring the available e-resources. This was in agreement with the report presented by and Saulus (2017) who exposed that, empathy is perceived when the e-resources are readily accessible remotely, when the websites are quickly navigable, when documents are readily downloadable, when the system notifies the patron on updates on new journal articles. Considering the scope of the previous studies which were based on other sections of the library departments, the current study was different in that, it determined empathy of post-graduate service delivery among digital institutional repositories at university libraries in Meru County.

Locally, libraries in Kenya value customer care service and therefore, the contributions of this soft skill (empathy) cannot be overemphasized. However, the state of empathy and

service provision is deplorable and unexplored. Available studies have investigated on the challenges, technology and usability of digital institutional repositories (Ratanya, 2017; Ratanya & Muthee, 2018; Nunda, 2019; Sang et al. 2021; Kakai, 2018).

Mwiti (2017) and Ratanya (2017) have established that in KeMU and Egerton universities, digital institutional repositories were successfully established. The studies also exposed the challenges inhibiting utilization and growth of these platforms in these universities. They also noted that policies, staff and management support ensured continued service provision. However, it was noted that there were precedent challenges which hindered the utilization of the available services. Some of these were fear of plagiarism, slow collection development and limited awareness on the services on offer. This adds to the concern on reactions, perceptions and expectations of customers on nature of services they receive. This gap was filled by assessing the role of empathy on digital service provision to post-graduate students at university libraries in Meru County.

2.7 Assurance and Digital Institutional Repository Serice Provision

Assurance is a term which is associated with the ability to dispense courtesy when handling customers coupled with competencies, skills, knowledge and credibility when offering a service (Saulus, 2017). Therefore, assurance can be well explained through combining skills and ethical codes which are; courtesy, professionalism, competencies, security and credibility (Frahm-Arp et al., 2020). In information service delivery, assurance is the ability of a competent and skilled specialist to handle customers politely and meet their needs satisfactory. Therefore, a repository staff depicts the dominance of assurance when they have skills, are competent enough, knowledgeable, possesses soft skills such as being polite, trustworthy, honest, friendly, respectful and undoubtful of the service they offer

(Psoma, 2020). For the case of digital institutional repository service provision a working definition of assurance will therefore be consisting of the offer of tangible or intangible services by a competent employee who is courteous, ethical, truthful, respectable, honest, and knowledgeable and is aware of information security measures. In a simpler way, it is the ability of a repository administrator to command believe, trust and confidence to users by applying relevant knowledge, skills and competencies when attending to them.

Assurance is demonstrated through a number of dimensions among digital institutional repositories. Some of this indicative dimensions include; employees behavior and mannerism, customer perception of safety, staff cautiousness and employee knowledge (Frahm-Arp et al., 2020). In digital institutional repositories, the systems may also denote assurance. This may be indicated by the ability of the database to retrieve and download searched materials, provide spelling suggestion and alternative searches, security features of the systems and also perceived user trust of the web pages (Psoma, 2020). Other characteristics that define assurance are; courtesy, politeness, friendliness, consideration, knowledgeable, competent, skilled, honest, security, believability, freedom from risk, danger and credibility features (Saulus, 2017).

Employees working in digital institutional repositories can demonstrate assurance by possessing the correct academic qualification of a degree in library and information science. Also by having technical skills on how to navigate through the repository, information retrieval skills, information management, preservation and accessibility competencies (Salam et al., 2018). Assurance may also be build up through growing office interpersonal skills and communication skills. Apart from that, the ethical and professional code of conduct for university librarians can also be an effective tool for guiding employee

dress code, professional demeanor, mannerism and conduct when in the digital repository premises (Salam et al., 2018). Apart from that, other etiquette coupled with politeness, respect, truthfulness, trustworthiness and friendliness can be important inborn or acquired cues for attaining patrons' assurance.

Assuring repository users is an important quality which benefits the library and universities in a variety of ways. In this hand, it improves customer experience, wins clientele trust and loyalty (Kiriienko, 2020). On the other hand, the organization secures an opportunity to retain potential users of repository services, cut on many costs and also earn good reputational branding (Koala customer care, 2022). Assurance also contributes to the meeting of the organizational performance. For the employees who are expected to be knowledgeable, skilled and competent enough, assurance qualifies their regular professional growth and development (Kiriienko, 2020).

Globally the role of customer assurance in digital institutional repository service provision is recognized. In the United States of America, Canada, China, United Kingdom and Europe, this has been attained by investing in employees competencies, offering specialized courses and conducting customer care trainings (Fraser-Arnott, 2016; James et al., 2015; Khan & Sheikh, 2023). In the United States of America, Fraser-Arnott (2016) and Kang and Ritzhaupt (2015) scholars examined the competencies for the emerging responsibilities of librarians. It was clarified that, apart from undertaking the traditional roles, communication skills, customer handling; knowledge management and understanding user needs were among the very critical skills that were needful. When library information professionals were surveyed, it was found that there were five categories of skills which made information professionals outstanding in service delivery.

These were customer care, personal qualities, interpersonal skills, communication skills, technical skills and information/knowledge management competencies. It was recommended that when designing competency development opportunities for staff, these skills were to be part and parcel of the training objectives. The current study also acknowledged the role of professional development in impacting assurance in university libraries in Meru County. Unlike, Fraser-Arnott (2016) and Kang and Ritzhaupt (2015) scholars who were concerned with the general librarians role, this study was scoped in determining the assurance of digital institutional repository sections.

In Europe, James et al. (2015) conducted a longitudinal study aimed at establishing the change and shift experiences by librarians in the current century. Focusing on competencies and knowledge, it was established that these professional assets were pivotal in informing trustworthy, dependability and reliability by the clientele who needed their services. It was established that change was inevitable among information professionals based on the fact that competencies played a fundamental role in influencing service delivery. The study however did not establish the state of assurance on the nature of service delivery, a factor which the current research has done. Moreover, the current study was used a convergent research design hence, differences in the design context.

The perceived efficiency, usefulness and working ability of the open access repository system is also an enabler for securing user assurance. Digby (2021) and Asadi et al. (2019) investigated this by exposing the facets worth consideration when deploying technology and systems for repository management. The survey studies which were primarily quantitative in nature adopted the technology acceptance model to underpin the study objectives. The findings reported identified that purported usefulness, ease of use, meeting

of user needs, cost effectiveness, and reliability measures were the parameters that influenced the choice for a repository software. In this study, the focus was on determining the state of assurance: unlike the outgone researchers who were looking at the factors considered when planning to deploy a repository system. Other differences existing is on the research design where current both quantitative and qualitative data will be obtained through interviews and questionnaires.

In Africa, very few studies exist which underpin the construct of assurance and service delivery in digital institutional repositories. Existing studies have underscored the benefits and challenges in librarian innovativeness, blended skills and future roles of librarians (Cherinet, 2018; Abubakar & Attahir, 2018; Omosekejimi et al., 2019; Salubi, 2017). In Nigeria, the role of library and information science competency development was established by Salubi (2017) and Kpakiko (2017). The researchers identified important aspects which contributed to a viable information science curriculum. The studies discussed about the courses for making the syllabi and competencies expected to be acquired. Surveys were carried out to the university librarians in the chosen location and the findings reported that, the existing syllabi was inadequate in informing required skills and competencies in librarianship. Recommendation highlighted a need to revive and reorganize the existing curriculum by incorporating the missing needs. However, the studies were not scoped to expose the status of assurance which the current investigation did.

The role of interpersonal competencies in tracking changing user needs in university libraries was established by scholars such as Cherinet (2018), Decker (2017) and Vassilakaki and Moniarou-Papaconstantinou (2015). Cherinet applied a qualitative

methods which adopted Delphi technique while the others quantitative methods and descriptive designs to allay insights. The studies found that skills and knowledge comprising of synergy of passion, cultural intelligence, discipline, professionalism impacted service delivery. For Decker (2017), the findings implicated on the need to conduct frequent and regular professional development trainings in order to realize their effectiveness in library management. These studies however did connect the relationship between competencies and service assurance among the library dockets. The current study examined the extent assurance of digital institutional repository service delivery in university libraries in Meru County.

The role of creativity kills was expanded in the research conducted by Abubakar and Attahir (2018). Specifying on the creativity and innovative skills, the study explained their level of influence in impacting service delivery. Some of these were enlisted as; the various sources of information, information retrieval strategies, and customer retain measures, customer attraction measures, information repackaging and distillation and technical skills for running and managing the information systems. Apart from that, it was established that the possession of innovativeness and creativity boosted speedy service delivery, availability of resources, and reliability of services and also assured user satisfaction. Despite these, challenges were experienced including; poor curriculum designed, limited technologies and poor innovativeness culture. The studies recommended the development of an innovative culture among librarianship environments in order to ensure efficient service delivery. This study specifically determined the assurance of repository services among post-graduate students.

In Kenya, the assurance of digital institutional repository services is highly deplorable. Existing research related to changing roles of librarians and trends in library management (Mwaniki, 2017; Otike & Hajdu Barat, 2021; Nakitare et al., 2020). Presented research by these researchers focused on the aspects of technology, user needs, professionalism and changing roles of librarians. The literature of Otike and Hajdu Barat (2021) articulate that, librarians were expected to adopt newer ways of managing library patron's needs. For this reason it was needful for them to continuously advance in their professional areas to cope with the regularly changing needs. Mwaniki (2017), Otike and Hajdu Barat (2021) and Nakitare et al. (2020) however reported the existence of many challenges such as limited staff, lack of funding, lack of professional development platforms and absolute technologies. Moreover, the needs of users were identified to be shifting regularly and henceforth, a need to for parameters for ensuring their satisfaction. Consequently, a study based on assurance of digital institutional repositories service provision is significant among post-graduate student in Meru County in order to improve quality service delivery.

2.8 Theoretical Framework

This research was guided by the SERVQUAL model (Podbrežnik, 2014) to assess service provision among digital institutional repositories.

2.8.1 The SERVIQUAL Model

The SERVQUAL Model was first developed by Valarie, Parasuraman and Berry marketing gurus in 1985 (Podbrežnik, 2014). The modest were concerned about the quality of services intangibility in organizations which was difficult to measure, and so they came up with a number of deliverables to address this. These researchers identified that, service quality among organizations was dimensionally being influenced by the nature of the goods,

products or service' tangibility, reliability, responsiveness, empathy or assurance dimensions (Podbrežnik, 2014). The model at first sight addressed that service delivery could be assessed using tangibles, reliability, responsiveness, courtesy, credibility, security, accessibility, communication, and understanding customer needs. Later on in 1988 and 1991 respectively, the theorists revised the model into five distinctive dimension which were simplified as; reliability, responsiveness, tangibility, empathy and assurance.

Reliability was concerned about the dependence, accuracy and relevancy of offered service while responsiveness was concerned to measure the promptness at which services were rendered (Proma, 2020; Saulua, 2017). For tangibility, the theorist had in mind about the physical facilities, infrastructure, technologies, human resources, equipment and personnel appearance (Proma, 2020; Saulua, 2017). Empathy was one of the models dimension and this was meant to address the caring and loving attitude of workers towards a client while the last construct covered assurance which was all about commanding trust to the client requiring a service from an organization (Proma, 2020; Saulua, 2017).

Based on their views, the investigation borrowed a lot from the gurus to underpinning the study variables; reliability, responsiveness, tangibility, empathy and assurance and the digital institutional repository information service provision. This is because after testing the applicability of the model, it significantly impacts digital institutional repository service provisions.

This model has however been subjected to some criticisms one of them being the inability for the modest to demonstrate the part of attitudes, perceptions and preferences noting that service delivery is intangible and it can only be felt. This shortfall however cannot discredit the model given that it has very profound applicable strengths which have been adopted

popularly in very many disciplines in marketing, tourism, libraries and educational institutions to measure service quality. The model has also stood a test of time by widening the understanding of service provision dimensions in a reliable and valid manner hence its application which successfully addressed the study needs. This study resonated that, improving service provision in digital institutional repositories require reliability, responsiveness, and tangibility, empathy and assurance variables.

2.9 Conceptual Framework

The conceptual framework demonstrated the relationship between SERVQUAL constructs developed by Valarie, Parasuraman and Berry in 1988 and digital institutional service provision in Meru County libraries. See Figure 2.1 for a diagrammatic presentation of the same.

Figure 2.1

Conceptual framework

Reliability
• Error free records
• Visibility of IR web page
• Relevant documents
• Equipped up to date information resources, workshop and studios
• Adequate of information

Responsiveness
• Prompt service delivery,
• Customer care emails
• Suggestion boxes
• Timely feedback
• Readily available employees to serve customers

Tangibility
• Easily navigable website
• Well organized contents management practices
• Adequate infrastructure
• Decent employees
• ICT resources available

IR Service provision
• Timely service delivery
• Customer satisfaction
• High utilization of services
• Efficiency of services delivered
• Growth of deposited items

Dependent variable

Empathy
• Remote accessibility of services
• Convenient operating hours
• Courteous, respectable, employee culture
• quick access to information
• Downloadable resources

Assurance
• Knowledgeable and competent staff
• Customer security
• Trustworthy resources and services
• Employee professionalism

Independent variables

The independent variables cover SERVQUAL model constructs (Podbrežnik, 2014; Valarie et al., 1988): reliability, responsiveness, tangibility, empathy and assurance, which influence, service delivery in digital institutional repositories in Meru County.

Reliability was characterized by the comprehensiveness of the information services, appropriateness of the services, dependability of the service, availability in the needed format and perceived helpfulness of the same. Also, repackaged services to meet the user needs, consistent sustainable services over a period of time and all time availability are excellent and informed insights that explain reliability. Responsiveness was evidenced by customer awareness on available services, prompt delivery, timely feedback, availability of repository manager and a perception that the employee is never busy to serve a user. Staff politeness and eloquence and availability of record complains book, a complain box are also key determinists to good responsiveness.

For tangibility, indicators such as a neat staff in appearance, modern fitted furniture and equipment, adequate physical facilities, service pamphlets, user guidelines, navigable institutional repository website, downloadable contents on the repository website and quick links characterized it. For empathy, it was characterized by paying attention to the patron, services are opened at convenient hours, customer perceives individual attention, understanding customer needs, e-resources are readily accessible remotely, when the websites are quickly navigable and when documents are readily downloadable. Assurance was evidenced by employee's behavior and mannerism, customer safety, staff cautiousness and employee knowledge competencies. Ability of the database to retrieve and download searched materials, the ability of the system to provide spelling suggestion and alternative

searches, adequate security features of the systems and also perceived user trust of the web page will also mean assurance of service.

Service delivery by repository managers was be the dependent variable for this study. This one was constituted by readily accessibility of hosted services, timely delivery of services, responsiveness, easy information find-ability and statistics showing increase in contents depositions in Meru County. In conclusion, the study assessed the applicability of reliability, responsiveness, tangibility, empathy and assurance indicators on digital institutional repository service provision.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section presents the methodology undertaken to assess how applying the SERVQUAL (Valarie et al., 1988) model improves digital institutional repository services to post graduate students at universities in Meru County. Discussion covered the site and environment of the study, research design, targeted audience and sampling design underpropping the current assessment. Successive sections provided a description of the research tools, piloting of the instruments, validity and reliability and data analysis approaches. The concluding section outlined the ethical issues guiding the research.

3.2 Location of the Study

The research was carried out in Meru County. Universities situated in this county are Kenya Methodist University (KeMU), Meru University of Science and Technology, Mt. Kenya University and Chuka University-Igembe Campus. The County is situated on the east side of Mt. Kenya and it covers an approximate area of 6,936 square kilometers (Meru County Website, 2022). The study was carried out in KeMU and MUST respectively. Mt. Kenya University and Chuka University-Igembe Campus were outside the study scope as they are constituent branches of their main campuses; hence did not have the institutional repositories since the main IR service points are managed from main campuses. KeMU is a chartered Christian private university while Meru University of Science and Technology (MUST) a public university and are both recognized for their academic excellence and research. Both have established libraries with user services, digital services, collection development, reference and cultural and special collection sections where the institutional repository services are offered.

The choice for this location lies in the premise of being global figures in offering a variety of post-graduate programs, qualified and reputable academic staff and who are actively involved in research publishing. Moreover, these libraries have adopted ICT automation technologies in the library to offer digital institutional repository service. Moreover, other investments such as; human, legal, technological and infrastructural have been effected in the digital institutional repositories by the university management (Kenya Methodist University, 2020; CUE, 2018). These profound investments channeled towards the open access docket interested the study to assess the state of service provision among the institutional repository so as to inform parameters for realizing improvement. Moreover, the reported findings by Saulus et al. (2017), Mwiti (2017), Ogenga (2015), Kakai (2018), Nunda (2019), Fasae et al. (2017), Wangondu and Winfred (2018) and Maina (2018) on the poor service provision of digital institutional repository services in libraries necessitated the study to carry out an invstigation in Meru County contemplating that Kenya Methodist University and Meru University of Science and Technology may not be peculiar.

3.3 Research Design

The analysis found utility in embracing a convergent embedded research design to underscore how applying the SERVQUAL Model (Valarie et al., 1988) improves institutional repository services to post-graduate students at universities in Meru County. The purpose of this type of design is to validate the findings generated by both qualitative and quantitative data through evidence produced by the other. The suitability of the preferred design was versed in the ability of the current assessment to utilize post-graduate student's quantitative data as primary data to assess the state of institutional repository

service delivery (Patton, 2015). Owing to this, the underlying affairs surrounding the humanistic quality service deliverables underpinned in the SERVQUAL Model developed by Valarie, Parasuraman and Berry (reliability, responsiveness, tangibility, empathy and assurance) were investigated.

The design also enabled the study to obtain qualitative data from open ended questions and interviews which was meant to supplement the quantitative data. This helped obtain views, explanations and excerpts which established the on-going affairs, individual attitudes, aptitudes, preferences, suggestions, coping mechanisms and opinions (Bryman, 2012). This design also was advantageous in that, the researcher was able to gather both qualitative and quantitative data from the two sets of respondents at the same time. Notably, it is indispensable that, a convergent embedded design supported the implementation of a mixed methods study.

Moreover, it is noticeable that through this design, findings categorized in themes were embedded/converged into the quantitative results to supplement and strengthen the presented graphs, tables, and charts with thematic explanations as conclusions. This meant that, quantitative findings were discussed first and later, supportive themes were embedded or included to strengthen the presented results. Lastly, this design positioned the research in a better place to refute or support the provisions of the adopted SERVQUAL Model constructs; reliability, responsiveness, tangibility, empathy and assurance on institutional repository service delivery.

3.4 Target Population

The current study assessed how reliability, responsiveness, tangibility, empathy and assurance SERVQUAL constructs (Valarie et al., 1988; Podbrežnik, 2014) improve

institutional repository services to post-graduate student in KeMU and MUST universities. There are 900 post-graduate students and 10 library heads of departments at KeMU and MUST respectively. Therefore, 10 library head of departments and 900 post-graduate students made 910 which is the target population. By the virtue that the digital institutional repository services are offered from the library department, library staff represented by the heads of sections in the main campuses were considered as the part of the informants since they have adequate knowledge about the services offered in the institutional repositories. These respondents, gave depth and clear opinions regarding reliability, responsiveness, tangibility, empathy and assurance. Furthermore, noting that the study aimed at investigating service provision among post-graduate students in Meru County, students constituted potential respondents for the study. Their contributions were viable in exposing their perceptions, views, attitudes and preferences regarding reliability, responsiveness, tangibility, empathy and assurance principles and how they influence the rendering of services in digital institutional repositories. Table 3.1 provides a summary of the target population.

Table 3.1

Target Population

Category	P-students	Library Heads of sections
1. Meru university	475	6
2. Kenya Methodist university	425	4
Total	900	10

3.5 Sample Size and Sampling Techniques

The representative population which took part in the data gathering exercise was derived from head of sections librarians and post-graduate students in MUST and KeMU. For the students, the argument credited to Mugenda and Mugenda (2003) underscoring that 10% - 30% of the target population provides reasonable representation of the key responders was utilized to get their sample size. Notwithstanding, 10% of the 475 post-graduate students in MUST and 425 from KeMU were representative enough to attend to the questionnaire tools. This led to a provision of 91 post-graduate students, making a total of 101, which was the sample size. A summary of sample size is provided in Table 3.2.

Table 3.2

Sample size

Category	Target P-students	Sample size P-students	Number of head of departments	The sample size head of departments
1. Meru university	475	48	6	6
2. Kenya Methodist university	425	43	4	4
Total	900	91	10	10

For the sampling criterion guiding the arrival of the noted sampling size, a purposive sampling technique was used to adopt the 10 heads of section librarians in the libraries. Consequently, the 10 interview were considered adequate since the sample possessed

homogeneous characteristics. Apart from that, the recommendation by Young et al. (2017) and Hagaman and Wutich (2017) who described a maximum of 14 interviews as sufficient for a homogenous population, formed a baseline for supporting the 10 conducted interviewers. Simple random sampling technique was employed to obtain the 91 who filled the post-graduate questionnaires.

3.6 Research Instruments

This study used questionnaires and interview guides to assess service provision by libraries to post-graduate students at selected universities in Meru County. A description of each tool is given in the following sections.

3.6.1 Questionnaires

Post-graduate students were issued with questionnaire tools to give their aptitudes, reactions, perceptions and insights on reliability, responsiveness, and tangibility, empathy and accessibility practices for improving institutional repository services at their respective universities. The easiness to administer, elimination of biasness stances and solicitation of primary basic facts are among the convincing reasons that influenced this consideration. Moreover, this instrument is most preferred due to its time, financial and economic saving in comparison to carrying out an interview for all the responders. It is also worth noting that the tool is advantageous premised on the fact that filled questionnaires can easily be interpreted, quantified, compared and contrasted while taking care of the informant privacy, anonymity and identity non-recognizance (David & Sutton, 2011).

The outline describing and demonstrating the structure of this tool is as follows: majorly, most questions were closed ended with very little room for open ended questions. All the quantitative sentiments were in a uniform representation of five likert scale probable

measures. It is also good to say that the organization were accordance to the study objectives underscored in chapter one and two. Each section was alphabetically serialized such that section A detailed the biographical details of the responders, section B, C, D, E and F, the independent or model constructs which are; reliability, responsiveness, tangibility, empathy and accessibility in the respective order.

The last section was G, and this one had sentiments and open ended question on institutional repository service delivery; the dependent construct in the analysis. Notably, the content presented in the tools was borrowed from the literature consulted, the theoretical and conceptual framework and tools by Asogwa et al. (2014), Ogenga (2015), Psona (2020), Saulus (2017), and Daniel and Berinyuy (2010). The questionnaire tool is in appendix II.

3.6.2 The Interview Guide

The head of sections in the libraries were interviewed. An interview guide was used by the researcher as a guiding template for carrying out the one-on-one interview. Through this tool, detailed information on the state of service provision in digital institutional repositories and comprehension of; reliability, responsiveness, tangibility, empathy and assurance was examined. The questions in each section of the tool conformed to those presented in the questionnaires. When carrying out the interview, the researcher also observed the non-verbal cues including attitudes, facial expressions and reactions for further understand of the phenomena investigated. Interviewing was also beneficial because, both parties had a room to seek clarifications on aspects which were not clear.

Constructively, the interview guide was categorised into seven section starting with the demographic details, the independent variables and the last section, the dependent variable.

Section A outlined the demographic details of the heads of sections librarians in Meru and Kenya Methodist Universities, sections B, C, D, E and F covered reliability, responsiveness, tangibility, empathy and assurance. The last section G was on digital institutional repository service provision in Meru County. When coming up with the interview questions, specific, concise, interrogative and relevant sentences developed. This was executed through the guide of the literature reviewed in the previous chapter including the conceptual framework. The tool is found in appendix III.

3.8 Validity and Reliability of Research Instruments

These were achieved through the pretest operation, conducting meticulous literature review and accommodating supervisor's subjective critiques and thoughts.

3.8.1 Validity of Research Instruments

Different points of views were embraced in order for the investigation to be in possession of utilizing valid tools. Justifiable content was earned through ensuring that sentiments addressing reliability, responsiveness, tangibility, empathy, accessibility and institutional repository service provision in a respective order are provided. Chapter two content displaying the current situation in respect to the variables was also instructional in communicating specific factual sentiments which the responders acted upon. The SERVQUAL Model constructs explanation and the conceptual framework also gave clear guidance on what themes need to be featured in the tools. Apart from that, the allocated supervisors and oral examination panellists contributed in edifying the tools.

In order to bring about constructive development of the instruments, heading, sub-heading, sectioning and breaking up of the objectives of the study into chronologically description segments was done so as to adequately probe all the objectives. For desirable construct

achievement, tools by Asogwa et al. (2014), Saulus (2017), Psoma (2020) and Ogenga (2015) were borrowed a lot. Piloting in Embu University was undertaken to allay any atelier inconsistencies on the face validity. By doing so, piloting data was helpful in addressing self-contradictions and unclear statements. Note that, supervisor's guidance was key in giving the tools a presentable face.

3.8.2 Reliability of Research Instruments

Here, it is about the ability of the tools to enlist homogenous demographic, attitudinal, perceptual, psychological, political, legal and social mannerisms at different times and even when different people are engaged (Bryan, 2014). To achieve reliability, the pre-test questionnaires and interview opinions were entered into SPSS software and Cronbach alpha value was computed. A coefficient alpha value, >0.7, obtained was sufficient (Siegle, 2011).

3.7 Piloting of Research Instruments

Pre-testing was considered primarily to alleviate any shortcomings residuals in the tools. An environment portraying indistinguishable qualities and mannerism to the locale of the investigation was chosen to correct literal, fallacies, variability, vagueness, equivocations and content appropriateness (Bryman, 2012). In doing so, the opinions from the main respondent were reliable and valid. The pre-testing sample size was informed by David and Sutton (2011) which hold that, a pretest case from 1% to 10% is adequate. Henceforth, the assessment resolved for the upper range (10%) to obtain the sample size for the purposes of ensuring highly reliable and valid tools. That being the case, 10% of Embu University post-graduate students and the library heads of sections were picked out using a simple random sampling technique.

The choice for Embu University in Embu County was due to its proximity, similitude, analogy and resemblance in innumerable characteristics. Being a neighboring institution of higher learning in the next nearby county, the digital institutional repository service deliverables are almost homogeneous. The self-administering of the tools went on a long way to out-turn reverberations, variability and unpredictability which aligned the data with the study goals.

3.9 Data Collection Procedures

In this study, procedures were employed to issue questionnaires to the post-graduate students and conduct the interview to the head of section librarians. Specific procedures for each is provided in the subsequent sections.

3.9.1 Procedure for Administering the Questionnaire

Questionnaires were issued out to the post-graduate students in Meru County universities. Before this, necessary preparation was done. The investigator acquired a clearance letter from Kenya Methodist University, department of Post-graduate Studies. This letter helped progress and facilitate the acquisition of national research permit from NACOSTI. With this two important documents, the scientist got approval to collect data at both university premises from the top administration. The researcher also visited the premises and arranged with sampled post-graduate students on appropriate venue, time and location for data collection.

Before the actual day, the data gathering assistants were trained and enlightened on the purpose of the research, the need for the data, expected demeanor and conduct during the field day and how to communicate to respondents. In the due day, the respondents were introduced to data collection where the aim, intentions, need for their opinions, assured of

privacy, confidentiality, and request for voluntary participation were explained. When this was clear, the questionnaires were issued out to the respondents to fill. After successful filling, the questionnaires were hand-picked. Participants who were found committed that day were granted more time to attend to the given tools and picked later from the individuals as agreed. Gathered tools were checked for completeness and enumerated sequentially.

3.9.2 Procedure for Conducting an Interview

About the procedure for carrying out the interviews, researcher made appointments with the library heads of sections after getting permission from the university librarians. Seeing the heads of section earlier enabled planning and making necessary arrangements on the venue and time for conducting the interview. The head of section librarians were reminded through phone calls. The interviews were conducted on one-on-one interaction basis. The researcher made necessary introduction, set the pace and atmosphere for conversing which made the interviewee comfortable.

The interview schedule developed was adopted to guide and facilitate the interview interaction. Also, the researcher sought permission to jot down some notes and do an audio mobile phone recording which helped in reporting. The researcher ensured a friendly environment which made the interaction joyous, detailed and comfortable, which gave room for clarifications, questions and explanations. At the end of each interview session, an interviewee was thanked with a thank you note.

3.10 Data Analysis Procedures

Quantitative and qualitative data was analyzed appropriately and the specific procedures for conducting each of them discussed comprehensively.

3.10.1 The analysis of quantitative data

The complete, chronologically serialized tools' details were entered into the SPSS software version 26. Descriptive statistics were employed to compute and generate the quantitative insights using mean, percentages and standard deviation which were presented in form of tables, and figures. These tables and figures were interpreted and discussed accordingly. This was important to elucidate important aspects on the status and applicability of SERVQUAL Model constructs (reliability, responsiveness, tangibility, empathy, assurance) on digital institutional repository service provision.

Afterwards, inferential statistics were investigated to check diagnostic conditions including, normality test, heteroscedasticity test and multi-collinearity tests to determine the utilizing of multiple regression analysis. To achieve this, the following model was adopted;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \hat{e}$$

Where: Y = institutional repository services

β_i = Coefficients to be estimated

X1 = Reliability

X2 = Responsiveness

X3 = Tangibility

X4 = Empathy

X5 = Assurance

ê = Error term

One way ANOVA was computed to compare reliability, responsiveness, tangibility, empathy, assurance and institutional repository service provision insights from the post-graduate students.

3.10.2 Procedures for Analyzing Qualitative Data

Lastly, qualitative data gathered from the few open-ended questions of the questionnaires and interview data for each construct was classified, organized and analyzed thematically as per the study objectives. This was made possible through adopting inductive and deductive reasoning to develop themes on reliability, responsiveness, tangibility, empathy, assurance and digital institutional repository service provision. Descriptive short narrations were utilized to report the presented themes.

3.11 Ethical Considerations

The researcher obtained a clearance and an introductory letter from the university. The investigator also adhered to the required research standards by seeking a permit from NACOSTI. A go ahead to undertake data collection was achieved through a consent from the top leadership members of Kenya Methodist University and Meru University of Science and Technology respectively.

Apart from the NACOSTI and introduction letters, the researcher also presented a concise cover letter underscoring the scientific inquiry intent, goals, and data soliciting parameters, utility and usability to the sampled population. This was the very document that was read aloud to the participating post-graduate students during the exercise so as to affirm confidentiality, privacy and desirable motives in order to win responsiveness, truthfulness, openness and sincerity when filling the tools.

The gathered sample size was granted equal and fair chances to voluntarily take part in the data collection activity. Also, busy participants were granted a chance to fill the tools later and collection was done in the agreed time. Privacy, confidentiality, ones' space and non-penetration was observed through the word of assurance and the given instructions that

were outlined in the questionnaire instruments which prohibited respondents from disclosing their identity through biographical details. In addition, security of their opinions and insights are perpetually preserved by safely keeping the filled questionnaires from unauthorized individuals apart from the researcher.

Academic nobility and honesty has been be attained by reporting the presented inferences as indicated by the sampled post-graduate and library heads of sections. To further assure this, all consulted literature was cited and referenced in line with the adopted standards of Kenya Methodist University in the APA 7th edition manual.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents, interprets and discusses the found results. This has been done in accordance to the objectives of the study. In the first instance, the findings on reliability of the data, response rate and the background information of post-graduate students and library head of sections are presented. The study had six main variables; digital institutional repository service provision, reliability, responsiveness, tangibility, empathy and assurance. In each of the mentioned variable, quantitative data are presented first and thereafter the incorporation of consolidated qualitative data gathered through interviews from the library heads of sections. Each variable's results presentation is followed by interpretation and lastly, a discussion from previous literature. Multiple linear regression analysis was also carried out to present findings for testing the overall applicability of SERVQUAL model in institutional repository service provision among university libraries.

4.2 Results on Response Rate

The study administered 91 questionnaires to post-graduate students at universities in Meru County. After the data gathering exercise, 72 were returned where, out of the stated number, only 67(73.0%) were completely filled, hence valid. For the library head of sections, the study had intended to interview 10 librarians, but 9(90%) were available for the one-on-one interview session. The study therefore, had an overall response rate of 75.2%, which was good. The good response rate was due to cooperation of library heads of sections and post-graduate students. Apart from that, the availability of most post-graduate students in the university premises was favorable since the administration of questionnaires was carried out near examination time. These findings agree with the

recommendation put across by Mugenda and Mugenda (2003) that, a response rate of 70% and above is an excellent representation of the study respondents. Similarly, Babbie and Mouton (2001) posited that, response rates of 60% and 70% are classified as good and very good; while, a study which establishes a response rate of 50% is still adequate for carrying out data analysis.

4.3 Results on Reliability Tests

Before utilizing the data to compute results, the study assessed its correctness and dependability. This was checked by computing the correlation coefficients of sentiments from the independent and dependent variables, where the Cronbach Bach alpha values were examined to aid determination on reliability. The reliability results showing the Cronbach Bach alpha values are presented in Table 4.1.

Table 4.1

Reliability result on items in the main variables of the study

Main variables of the study (N = 67)	Cronbach's Alpha
Reliability (X1)	0.894
Responsiveness (X2)	0.862
Tangibility (X3)	0.826
Empathy (X4)	0.891
Assurance (X5)	0.887
Digital institutional repository service provision (Y)	0.896

Table 4.1 shows that the Cronbach's Bach values for each construct was greater than 0.7, ($\alpha > 0.700$). This implied that the data gathered was reliable. According to Bryman and Bell (2011), data which presents a Cronbach's alpha values greater than .700 is satisfactory to be utilized in analysis.

90

4.4 Background Characteristics of Respondents

In this section, the background characteristics of post-graduate students and head of section librarians is provided. Some of the key information gathered pertaining the characteristics of respondents included; their gender, highest educational qualification and length of service. Demographic details for post-graduate students and head of section librarians are summarized in Tables 4.2 and 4.3 respectively.

4.4.1 Demographic Characteristics of Post-graduate Students

Table 4.2

Demographic Characteristics of post-graduate students

Characteristics	Description	Frequency	Percentage
Gender	Female	34	50.7
	Male	33	49.3
	Total	67	100.0
Level of Education	Post-graduate diploma	10	14.9
	Masters	48	71.6
	Ph.D	9	13.4
	Total	67	100.0

Table 4.2 indicates that there were more female than male post-graduate students at universities in Meru County. The male post-graduate students were 33 (49.3%), while female students were 34 (50.7%). Despite the slight difference, this shows gender impartiality among post-graduate students enrolled in universities in Meru County. The demographic findings concur with the observation made by Saulus (2017) that in the University of Swaziland, the population of post-graduate students was dominated by the

female gender. In the contrary, Achieng (2016) presented that in Nairobi University, post-graduate students were dominated by the male gender as compared to female counterparts. Another characteristic sought about post-graduate students was on education level. Table 4.2 shows the levels of education the participating individuals were pursuing at the universities in Meru County. It is clear that most of the students, 48(71.6%) were pursuing their masters degrees; 10(14.9%) said were doing post-graduate diploma, while only 9(13.4%) were pursuing doctorate degrees. This shows majority of students pursuing post graduate degrees were undertaking masters degrees at universities in Meru County. The study regarded all the post-graduate students across the three levels of study as sufficient in providing reliable information on service provision in digital institutional repositories at university libraries in Meru County. At St. Paul's University in Limuru, Wangui (2018) also observed a similar trend with regards to post-graduate students enrolled for various courses. Wangui (2018) established that, two thirds of the population comprised of masters students and only about a quarter were PhD students.

4.4.2 Demographic Characteristics of Head of Section Librarians

In this study, the demographic characteristics of head of section librarians sought was on how long one had served as a head of section librarian.

Table 4.3

Demographic Characteristics of Head of Section Librarians

Aspect of demography	Description	Frequency	Percent
Length served as a head of section librarian	1-5 years	2	22.2
	5-10 years	4	44.4
	above 10 years	3	33.3
	Total	9	100.0

According to the results in Table 4.3, 4(44.4%) head of section librarians had worked between 5 and 10 years and 3(33.3%) 10 years and above. Only 2(22.2%) had served between 1 and 5 years. This means that, majority of the head of section librarians who took part in the interview had adequate experience on service provision in digital institutional repositories among university libraries. The working experience was regarded sufficient in providing credible information on awareness, practices and techniques for post-graduate service provision. Haylenchale (2020) reported related findings that, in Dilla University, most academic staff including librarians had accumulative working experience of between 6-10 years in their current points of service. Working experience ranging from three years and above was reported by Haylenchale to be adequate time which assured respondents had interacted and identified the practices, challenges and what works for an organization.

4.5 Reliability of Digital Institutional Repository Service Provision

The first objective of the study aimed to determine the reliability of digital institutional repository service provision at selected universities in Meru County. Reliability was evaluated to identify the extent to which this aspect affected or helped to improve the provision of digital institutional repository service to post-graduate students. Information was gathered from the post-graduate students and the head of section librarians at universities in Meru County. Some of the aspects sought regarding reliability were on; accuracy of information services, the promised nature of services, appropriate handling of user needs, timeliness in service provision, visibility of the repository page, function ability of the repository page, relevancy of the uploaded collections, up-to-datedness of the collection, accessibility of the library section and dependability of the collection for research purposes.

The respondents were expected to respond to the statements by choosing their best opinions in a 5-level Likert rating scale. The rating for each sentiment was coded in SPSS, where, 5 represented VLE = very large extent, 4 for LE= large extent, 3 ME= moderate extent, 2 SE = small extent and 1 VSE= very small extent. In presenting the descriptive findings, mean values and standard deviation for each statement in the table was computed. For interpretation and reporting, the post-graduate students responses, the total number that chose very large extent and large extent was summed up to represent the agreement status, while the total number of those who chose very small extent and small extent was summed up to represent the disagreement status concerning reliability of digital institutional repository service provision. Table 4.4 gives a summary of the post-graduate student's responses gotten.

Table 4.4

Descriptive Results on Reliability

Statements on reliability (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
The repository provides me with accurate information resources	4(6.0%)	2(3.0%)	16(23.9%)	39(58.2%)	6(9.0%)	3.61	.920
I receive services in the repository exactly as they are promised during trainings, orientation and awareness period	2(3.0%)	4(6.0%)	28(41.8%)	22(32.8%)	11(16.4%)	3.54	.943
The problems I raise concerning information services are always handled in an appropriate manner	3(4.5%)	10(14.9%)	19(28.4%)	26(38.8%)	9(13.4%)	3.42	1.047
I receive the services I request in the repository at and within the promised time	2(3.0%)	6(9.0%)	26(38.8%)	26(38.8%)	7(10.4%)	3.45	.909
The repository link, page and website is always visible	0	8(11.9%)	20(29.9%)	21(31.3%)	18(26.9%)	3.73	.994
The repository link, page and web-site is working	1(1.5%)	8(11.9%)	39(58.2%)	12(17.9%)	7(10.4%)	3.24	.854

Statements on reliability (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
The collection housed in the repository are relevant to my search needs	3(4.5%)	9(13.4%)	15(22.4%)	35(52.2%)	5(7.5%)	3.45	.974
The repository information resources are always updated	4(6.0%)	7(10.4%)	15(22.4%)	29(43.3%)	12(17.9%)	3.57	1.090
The physical section for the repository is always accessible	5(7.5%)	5(7.5%)	27(40.3%)	15(22.4%)	15(22.4%)	3.45	1.145
The collection available in the repository are dependable for research and learning purposes	4(6.0%)	3(4.5%)	12(17.9%)	29(43.3%)	19(28.4%)	3.84	1.081

Table 4.4 is showing that post-graduate students were generally in agreement with most of the statements posed on reliability of digital institutional repository service provision at selected universities in Meru County, where, the mean was around 3.5. Concerning the function-ability of the repository page, the study noted moderate working which was represented by 39(58.2%). According to the students' responses, all aspects on reliability were playing a critical role in determining digital institutional repository service provision at selected universities in Meru County. This is because, the mean value for each indicator apart from the working of the repository link was above 3.4. The aspects that had high agreement levels were: dependability of the collection (mean = 3.84), visibility of the repository page (mean = 3.73), accuracy of the information resources (mean = 3.61), up-to-datedness of the collection (mean= 3.57) and the promised nature of services (mean = 3.54). The only aspect that was less famous in determining the reliability of digital institutional repository service provision was the working-ability of the repository link, page and web-site (mean = 3.24).

The descriptive results from post-graduate students underscored several aspects relating to reliability. The results show general consensus of how reliability aspects were playing a role in influencing the provision of digital institutional repository services to post-graduate students at selected universities in Meru County. These aspects were: accuracy of information services, the promised nature of services, appropriate handling of user needs, timeliness in service provision, visibility of the repository page, function ability of the repository page, relevancy of the uploaded collections, up-to-datedness of the collection, accessibility of the library section and dependability of the collection for research purposes.

This presented a status that the university libraries had set aside mechanisms to ensure reliable services.

When post-graduate students were asked in an open-ended question to suggest what should be done to make digital institutional repository services reliable in university libraries, they provided ten suggestions. The study developed three themes out of the ten suggestions. These were: ensuring daily function ability of the repository page, accessibility of the repository section during the destined opening hours, and improving on timeliness in service provision. One student emphasized "*The library should put a staff at the section to ensure it remains open whenever the main library is operational*" (Student number 49). A few students wrote that there should be post graduate computers in the digital institutional repository section.

These findings indicated that post-graduate students are aware of what was needed to be put in place in order to have reliable services among digital institutional repositories. The suggestions inferred a need to check the function-ability of the repository webpage and link regularly, extending the physical section opening hours and securing computers to enable learners to utilize the repository. These findings indicate a need for the repository section to have adequate ICT facilities in form of stable internet bandwidth, wifi and students computers to improve accessibility of institutional repository. On a similar observation, Trivedi and Bhatt (2019) also noted the contributions of relevant ICT infrastructure, facilities and software in improving the reliability of digital institutional repository services. Minesota, Digby (2021) also classified technological infrastructure as a great enabler for enhancing the reliability of digital institutional repository services.

An in-depth interview was conducted with the head of section librarians at selected universities in Meru County. The librarians were asked to describe the measures they had put in place to achieve aspects of reliability of services in their library institutions. Two major themes were obtained from the eleven answers. The study identified that; testing the repository link was done regularly to ensure it is working, and Wifi availability was checked so that students can access the repository with their phones. Another librarian emphasized *"I check every morning after reporting to work if the repository page is working"'* (L 02). Head of section librarian 04 said "I *shelve the physical section of the repository every day to ensure students can easily access the submitted information materials"* These key activities identified from interview responses, if well executed, would assure the reliability of digital repository services. Apart from that, the heads of section results also implied that librarians had prioritized the information needs of students. Similarly, Mooketsi (2020) also acknowledged the contributions of library staff in ensuring post-graduate students result to efficient, dependable and reliable services. Furthermore, reliability was termed to possess influence on digital institutional repository services through improving accessibility of both online and physical section of the repository. In conjunction, Peng et al. (2018) and Lin et al. (2020) also noted that reliability in repositories contributed to the development of confidence on the rendered services, earns trust, and leads to improved accessibility of services, and satisfaction of user information needs.

The presented results are also pointing on a need to revise the opening and closing hours of the repository section so as to ensure improved accessibility. In agreement, Saulus (2017) presented that little utilization of digital repositories in South Africa was as a result of influential factors which among them was limited operational hours allocated to

repositories. Saulus suggested that, the challenge could be as a result of limited number of repository managers in charge of the section.

The results also underscored the need to give post-graduate student prompt or timely feedback any time they request for digital institutional repository services. Timely response to customers is a strategy for boosting their trustworthiness, availability, dependability and henceforth perceived reliability of services. These efforts require the availability of clear communication channels such as emails and webpage chat box. The same was also noted by Digby (2021) who presented that, technology such as emails and ask a librarian chat boxes improved service provider-customer relations in information service provision. Apart from that, the results are pointing the need for institutional repository manager's professional development, retooling and capacity building skills on customer care and feedback handling. This was also agreed in the findings of Alam and Mezbah-ul-Islam (2021) who identified that reliability of services was the most influential factor in service provision. Alam and Mezbah-ul-Islam (2021) further elaborated that the facets which ensured the reliability of services was the presence of qualified and competent staff who are conversant with the needs of the customers.

4.6 Responsiveness of Digital Institutional Repository Serice Provision

The second objective of the study aimed to determine the responsiveness of digital institutional repository service provision at selected universities in Meru County. Responsiveness was evaluated to gauge its influence on the provision of digital institutional repository service provision among post-graduate students. This objective aimed to assess timeliness, promptness, willingness and ability of service providers to act with urgency towards customers request (Psoma, 2020). According to Trivedi and Bhatt (2019) the

readily availability of the repository manager and the perceived willingness to guide or help a customer also constitute responsiveness.

In order to determine the responsiveness aspects in digital institutional repository service provision, post-graduate students were asked to give out information on their perceptions and views at university libraries in Meru County. Some of the aspects sought regarding responsiveness were; prompt information service delivery, staff timeliness in responding to queries, staff willingness to help customers, staff attentiveness to customer needs, ability of repository to give back relevant answers to the search terms and key words searched, presence of a repository email for submitting queries, complains and compliments and staff etiquette and politeness.

The students were expected to respond to the statements by choosing their best opinions in a 5-level Likert rating scale. The rating for each sentiment was coded in SPSS, where, 5 represented VLE = very large extent, 4 for LE= large extent, 3 ME= moderate extent, 2 SE = small extent and 1 VSE= very small extent. In presenting the descriptive findings, mean values and standard deviation for each statement in the table was computed. For interpretation and reporting the post-graduate students responses, the total number that chose very large extent and large extent was summed up to represent the agreement status, while the total number of those who chose very small extent and small extent was summed up to represent the disagreement status. Table 4.5 provides a summary of the post-graduate student's replies obtained.

Table 4.5

Descriptive Results on Responsiveness

Statements on responsiveness (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
I enjoy prompt information service delivery I request from the out institutional repository	4(6.0%)	6(9.0%)	22(32.8%)	28(41.8%)	7(10.4%)	3.42	1.002
The repository staff timely respond to my queries	1(1.5%)	4(6.0%)	23(34.3%)	24(35.8%)	15(22.4%)	3.72	.934
The staff in charge of the repository service are always willing to help	0	5(7.5%)	15(22.4%)	27(40.3%)	20(29.9%)	3.93	.910
The staff managing the institutional repository section pays attention to my information needs requests	2(3.0%)	8(11.9%)	11(16.4%)	28(41.8%)	18(26.9%)	3.78	1.071
When I query the repository page, it always bring relevant answers to the search terms and key words	2(3.0%)	5(7.5%)	19(28.4%)	23(34.3%)	18(26.9%)	3.75	1.035

Statements on responsiveness (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
There is an email for sending any complaints and compliments to the librarians in the library repository	4(6.0%)	36(53.7%)	17(25.4%)	5(7.5%)	5(7.5%)	2.57	.988
The staff in charge usually responds to user quarries in a very polite manner	1(1.5%)	4(6.0%)	11(16.4%)	27(40.3%)	24(35.8%)	4.03	.953
The repository website return feedback results immediately after a executing a search	0	8(11.9%)	14(20.9%)	33(49.3%)	12(17.9%)	3.73	.898

Table 4.5 is showing that post-graduate students were in agreement with most sentiments posed regarding responsiveness represented by mean values which were greater than 3.4. Specifically, there was high agreement on the aspects regarding staff etiquette, courtesy and politeness (mean = 4.03), staff willingness to help customers (mean = 3.93), staff attentiveness to customer needs (mean = 3.78), repository website always bringing relevant answers to search terms (mean= 3.75), the repository website returning feedback results immediately after executing a search (mean =3.73) and staff timely responding to customer queries (mean = 3.72). However, the students expressed their dissatisfaction on the aspect regarding the presence of an email for sending feedback, complaints and compliments (mean=2.57) to the librarians in the digital institutional repository platform as indicated by 36(53.7%) post-graduate students. However, 31(46.3%) of the students felt that the digital institutional repository section did not have adequate infrastructure, facilities and reading areas, leave alone the fact that repository services were ranked essential in guiding research, development and learners performance (mean= 4.12).

The above results have presented the ratings from post-graduate students on various aspects regarding responsiveness were reasonable. The level of agreement indicate some good level of responsiveness in service provision. This hinted on the importance of each responsiveness indicator in influencing digital institutional repository service provision. Satpathy (2017) also observed that responsive service providers needed to invest on important aspects such as, eloquence, communication etiquette, cherish customer feedback, depict willingness to help out, be in the shoes of the customer, and adopt technology to ease information service delivery, ability for requested service to be offered promptly and readily availability of the repository manager or the website link. Satpathy

(2017) argued that these aspects could be realized by investing in staff training and professional development, employing system and customer care librarians and also adopting modern technology and communication tools. Another study which hinted on the necessity of responsiveness in service provision was that of González-Pérez (2021). González-Pérez (2021) findings informed that, investing and implementing technological requirements, competency employees and prioritizing the needs of customers were parameters which assured organisational responsiveness.

The results have indicated that university libraries were making reasonable efforts to boost responsiveness. Some of the noted aspects include: etiquette, courtesy and politeness, willingness to help customers, attentiveness to customer needs, execution of relevant answers to search terms and timely responding to customer queries. However, there lacked an email communication platform where post-graduate students could drop their feedback, compliments, queries, comments and complains while interacting with the repository site. This was against the findings presented by Satpathy (2017) in the United Kingdom who observed that, digital institutional repository services were highly responsive as characterized by aspects like; customers were addressed politely and eloquently, and the availability of usable platforms where unsatisfied users can record complains in a book, suggestion box or through an institutional repository emails. The importance of communication and feedback channels was also recognized by Joo et al. (2019) in the United States. Joo et al. (2019) identified that, the most critical factors which improved responsive service delivery among institutional repositories was majoring on user needs communicated through the customer feedback tools.

Considering that responsiveness is a key factor in improving digital institutional repository service provision among post-graduate students; the extent of dissatisfaction with some aspects of responsiveness expressed by the lack of an email platform and unsatisfactory promptness to information delivery was discouraging. This point out opportunities for improvement. In order to address this challenge, the respondents were asked in an open-ended question to suggest what should be done to improve responsiveness in service provision. The students suggested twelve opinions. Themes were hence developed out of the twelve suggestions. These were: create an email account, develop a WhatsApp a librarian link or talk with us link for sending customer feedback, employing adequate staff for prompt service delivery and conduct staff trainings on customer care. On this aspect, a post-graduate student number 30 commented, "*The library has organized for school and departmental trainings in addition to the orientation that is conducted on admission. This has helps us to access the repository site on our own*".

The above results show that post-graduate students were aware of what was needed to be put in place in order to experience responsiveness in digital institutional repositories. The suggestions inferred a need to have customer feedback tools such as WhatsApp a repository manager, feedback goggle forms, chat a repository manager, quick links, page guiding tours, user guides, navigation panes and email a repository manager in order to meet post-graduate student's needs adequately. The role of communication channels was also recognized by Fagbohun et al. (2020) in Nigeria who presented that, apart from a website indicating the services being offered, quick links, guiding tours, user guides, navigation panes, chat a librarian and email a librarian were important platforms which saved the researchers from getting stranded when looking for information resources in a webpage.

The other suggested remedy was the employment of adequate number of staff which was meant to cause about prompt information service delivery. Employment of adequate staff in the digital institutional repository was meant to ensure accessibility of the physical section during the library operational hours. In line to the above discussion, studies such as Karanja (2017) and Njagi and Nmande (2018) also reported the employment of adequate institutional repository staff helpful in steering services and daily operations and service provision. Comparably, Trivedi and Bhatt (2019) also agreed that staff adequacy ensured that, at all times, a repository manager on duty is always readily available to serve customers in the library section.

The head of section librarians were asked to explain the measures the library had put in place to ensure responsiveness. From the responses given, most librarians said that, they had optimized and customized the database to ensure students obtain what they look for through subject, name and title search techniques. Moreover, prompt feedback, providing stable internet, wifi, having library user guides and ask a librarian platforms were among the responsive mechanisms adopted to steer service provision in institutional repositories. Librarian 09 explained that "*we encourage post-graduate students to attend trainings so that they learn about the information services that the library offers and how to access them*". In agreement, Jain (2020) explained that training users on how to assess resources on their own and also providing them with the required facilities and infrastructure assured institutional responsiveness.

Moreover, librarians were requested to explain the influence of responsiveness on institutional repositories. Responsiveness was reported to influence digital repository service provision by increasing visibility of the institution, promoted usability of

information resources and increased satisfaction of users' needs. This was also acknowledged by Janse van Vuren (2022) who said that, responsiveness enables libraries to maintain potential repository users, meet their needs satisfactory, improve operational efficiency, improve institutional image and branding, earn organizational performance, improve quality service delivery and manage monitoring, and facilitate evaluation through customer feedback.

The results from head of section librarians were majorly consistent with the report given by post-graduate students. Findings seem to put much emphasis on the heads of section librarians to work closely with the post-graduate students by being prompt, ensuring readily accessible services and training the students on how to access information resources uploaded in the institutional repository web-site. The most adopted strategies in the university libraries were; information search and retrieval optimization, communication channels and training. Repository manager- student relationship was also acknowledge a prerequisite for meeting efficient customer service by achieving library pro-activeness, responsiveness and efficiency (Isibor et al., 2016).

The above results underscore the need to invest in mechanisms for improving customer care, and point out communication etiquette expected of the staff in charge of digital institutional repositories. This calls for the university management to chip in through financial allocation and budgeting to cater for staff capacity building through attending seminars, benchmarking, workshops, trainings and conferences. The findings are in agreement with the observations of Trivedi and Bhatt (2019) who stressed that employees ought to possess a number of interpersonal, intrapersonal, competencies, technical, ICT

and communication skills in order to promptly and willingly, serve customers in institutional repositories.

4.7 Tangibility of Digital Institutional Repository Service Provision

The third aim of the study was to examine the influence of tangibility on digital institutional repository service provision at selected universities in Meru County. Tangibility of institutional repository services is about the appearance of the human resources or repository administrators, the availability of physical facilities, equipment, infrastructure, technological resources, reading tables, print and electronic information resources (Psoma, 2020; Saulus, 2017). The tangibility of the digital institutional repository was measured by posing 12 statements to post-graduate students. Moreover, a one-on-one interview was conducted in the study to head of section librarians at universities in Meru County.

Post-graduate students were expected to respond to the statements by choosing their best opinions in a 5-level Likert rating scale. The rating for each sentiment was coded in SPSS, where, 5 represented VLE = very large extent, 4 for LE= large extent, 3 ME= moderate extent, 2 SE = small extent and 1 VSE= very small extent. In presenting the descriptive findings, mean values and standard deviation for each statement in the table was computed. The tangibility aspects posed included; modern state of repository equipment, visual appealing nature of the physical facilities, appearance and grooming of the repository manager, adequacy of repository information resources, navigable state of the repository website, organization of the information resources, ability to download soft copy information resources, appearance of the section furniture, in service provision, visibility of the repository page, role of technology infrastructure in the repository and helpfulness of deposited information resources.

For ease of interpretation and reporting, the post-graduate students responses, the total number that chose very large extent and large extent was summed up to represent the agreement status, while the total number of those who chose very small extent and small extent was summed up to represent the disagreement status concerning tangibility of digital institutional repository service provision. Table 4.6 provides a summary of the replies received.

Table 4.6

Descriptive Results on Tangibility

Statements on tangibility (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
The repository section is equipped with modern useful equipment	6(9.0%)	15(22.4%)	22(32.8%)	23(34.3%)	1(1.5%)	2.97	1.000
The facilities available at the repository section are visually appealing	0	10(14.9%)	29(43.3%)	26(38.8%)	2(3.0%)	3.30	.759
The repository staff are appealing and neat in appearance	1(1.5%)	4(6.0%)	21(31.3%)	18(26.9%)	23(34.3%)	3.87	1.013
There are adequate information resources for academic purposes in the repository	2(3.0%)	8(11.9%)	34(50.7%)	17(25.4%)	6(9.0%)	3.25	.893
It is very easy to navigate the institutional repository web-site	1(1.5%)	5(7.5%)	22(32.8%)	28(41.8%)	11(16.4%)	3.64	.900
The content in the repository is well organized	0	4(6.0%)	20(29.9%)	32(47.8%)	11(16.4%)	3.75	.804
Documents in the repository are easily downloadable	1(1.5%)	3(4.5%)	21(31.3%)	30(44.8%)	12(17.9%)	3.73	.863

Statements on tangibility (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
Physical documents in the repository section are well organized	1(1.5%)	0	20(29.9%)	33(49.3%)	13(19.4%)	3.85	.783
The physical facilities and reading areas in the repository are well arranged	0	5(7.5%)	24(35.8%)	26(38.8%)	12(17.9%)	3.67	.860
The repository section in the library has adequate facilities	6(9.0%)	16(23.9%)	29(43.3%)	12(17.9%)	4(6.0%)	2.88	1.008
Technological infrastructure is essential in achieving tangibility of repository services	0	3(4.5%)	13(19.4%)	30(44.8%)	21(31.3%)	4.03	.834
I do feel that I have benefited from the services that I receive at repository section	2(3.0%)	3(4.5%)	24(35.8%)	25(37.3%)	13(19.4%)	3.66	.946

Table 4.6 show some level of agreement on the statements regarding the state of tangibility of digital institutional repositories at universities in Meru County. On fitting the section with modern useful equipment, the study found that repository sections were not adequately equipped (mean=2.97). These opinions confirmed the other statement posed regarding the physical facilities (mean=2.88) where the post-graduate responses underscored the repository sections lacked adequate physical facilities. No wonder 34(50.7%) of the respondents expressed a moderate opinion concerning the adequacy of deposited information resources in the institutional repositories. These responses agree with the obtained views which underpinned that technology and infrastructure was essential in achieving the tangibility of repository services as indicated by 51(76.1%) responses and a mean of 4.03.

The results are further indicating that, post-graduate students felt the state of tangibility was not that bad. This was indicated by the sense of agreement with most of the statements posed on tangibility of digital institutional repository service provision at selected universities in Meru County, where, the mean for a good number of the statements was more than 3.4. According to the students' responses, all aspects on tangibility were regarded critical in determining digital institutional repository service provision at selected universities in Meru County. The aspects that indicated satisfactory were: staff neatness and appearance, (mean = 3.87), well organization of the repository printed information resources (mean = 3.85), well organized electronic content (mean = 3.75), easily downloadable documents (mean= 3.73) and good arrangement of section physical facilities (mean= 3.67). The rate at which post-graduate students felt it was easy to navigate through the repository website was represented by a mean value of 3.64. Otherwise, the students

agreed that digital institutional repository services were beneficial to them (mean= 3.66). Despite this, the respondents expressed a need to address the appearance of physical resources, infrastructure, the adequacy of information resources and facilities. This made the students to rank the tangibility of digital institutional repositories as moderate.

The results are indicating the need to re-address technological infrastructure, physical facilities, modern equipment, navigation in the websites, downloadable information resources, organization of repositories, and classification of repository information resources and employees appearance to determine the tangibility of digital institutional repositories. This concerns were noted in the results of a study by Al Mahameed et al. (2021) and Ibrahim et al. (2022). These studies pointed out that tangibles in digital institutional repositories include staff appearance, evidence of modern fitted furniture and equipment, ambient physical facilities, service pamphlets that are visually appealing, top-notch user guidelines and brochures which are neatly designed.

Summary of responses are showing that institutional repositories at university libraries in Meru County did not have adequate infrastructure, information resources, and physical facilities. This condition was regarded to affect the institutional repository study environment, which had the potentials to affect effective service provision. The same was noted by Digby in 2021 who presented that, tangibles in a repository may be beneficial however, their inadequacy may be a major hindrance to effective service delivery. Digby argued that physical facilities, human resources, infrastructure, information resources, material and immaterial resources' determined successful rendering of digital repository services.

It was also revealed that having adequate infrastructure alone was not enough, but there was need to equip the sections with modern equipment. This was based on the suggested responses which inferred that the available resources were less attractive and modern. Similar findings were also reported by Salma et al. (2018) in Nigeria who informed that irregular electricity supply, outdated library materials, lack of functional library resources and old facilities risked the patronage of learners in the repository sections. Antasari et al. (2021) also lamented that websites that were rarely upgraded, poor bandwidth internet services, old buildings, old-fashioned furniture and resources limited service delivery especially to special groups of library patrons.

In looking for appropriate solutions, an open-ended question was posed to the students asking them to suggest what should be done to improve tangibility of digital institutional repositories. Key suggestion gotten from their responses included: refurbishing of the available reading tables, repainting of repository sections, acquisition of modern furniture, dusting of the shelved repository collections, publishing of more scholarly output, include full texts documents of the thesis and dissertations, include thesis for post-graduate diploma students in the repository, upgrading of the repository management system to a higher version and procuring students computers. These suggestions were directly pointing on achievable operational re-engineering of services and activities in the digital repository. The results also point out a need for managerial support to allocate maintenance finances, approving budgets and funding the acquisition of modern equipment. Other solutions for addressing tangibility of digital institutional repositories presented by Kakai et al. (2018) also emphasized on need for management intervention through financial support; for example, increasing library budgetary allocation and allocating a maintenance kit for

adopted technological infrastructure, furniture and other facilities. Achieng (2016) as well, presented findings that were largely similar. Achieng noted that the amount of allocated for university library annual budget, miscellaneous and maintenance funds determined the quantity and quality of information resources, physical infrastructure, and facilities for supporting service provision.

Similarly, the head of section librarians were asked during the interview to describe the measures they had put in place to achieve the tangibility of services. From the responses given, most librarians said that, they have policies and procedures guiding security of information, had acquired Dspace software, populated the repository with graduates materials each year, open the repository section during working hours, ensure that the website is working, shelving of repository resources and classification of repository information materials. Librarian 04 added, "*We liaise with the system librarian to ensure that the repository web-site is available, working and reachable to students*".

Moreover, librarians were requested to explain the influence of tangibility on institutional repositories. Tangibility was reported to influence digital repository service provision by increasing good customer service, promoted remote accessibility of information resources and increased satisfaction of user needs. Other studies exist which found the existence of influence between tangibility and digital institutional repository service provision. One of the studies was done by Kumar Roy et al. (2022) who reported that, tangibles achieved great outcomes for example, visual impression, saved users time for information search and retrieval and enhanced accessibility to information. Another study which also appreciated the influence of tangibility on repositories was carried by Ibrahim et al. (2022). Ibrahim et al. found that tangibles enhanced satisfaction of repository patrons, improved

institution reputation, scholarly visibility, and promoted the preservation of information resources.

The results from head of section librarians were majorly consistent with the views by post-graduate students. Findings acknowledged the role of technology in ensuring accessibility of resources, marketing to improve usability of resources, collection development of repository resources and classification of repository information materials to ease retrieval of information materials. Henceforth, the results indicate a need to strengthen these factors by acquiring adequate physical facilities, furniture and technological resources. The same was also presented in the findings of Bandyopadhyay and Boyd-Byrnes (2016) that, marketing strategies, policies, availability of adequate infrastructure and easy navigation of repository website promoted the tangibility of services. Moreover, Salman et al. (2018) agree with the findings that electricity supply, modern library materials, functional physical resources, adequate facilities, easy accessible sites and collection development of repository materials assure tangibility.

4.8 Empathy of Digital Institutional Repository Serice Provision

The fourth objective of the study aimed to determine the empathy of digital institutional repository service provision at selected universities in Meru County. The state of empathy was evaluated to identify how it contributed to the provision of digital institutional repository service to post-graduate students. Empathy was characterized by aspects including; customer sense of security, love, care, acknowledgement and attention when conversing, being guided or being served (Parasuraman et al., 1985). Other aspects are information services accessible remotely and how quick the repository bring results and 24/7 accessibility of services. Opinions were gathered from the post-graduate students and

117

the head of section librarians at universities in Meru County. Some of the aspects sought regarding empathy were; individual attention given to customers, repository operating hours, customer information needs and staff interest to serve repository users. Others are, remote accessibility of the repository resources, information retrieval procedures for repository section, ability of the site to save customers downloaded resources, spelling check and search logic for reminders of the repository, caring nature of staff and concerned nature of the repository personnel.

Post-graduate students were expected to respond to the statements by choosing their best opinions in a 5-level Likert rating scale. The rating for each sentiment was coded in SPSS, where, 5 represented VLE = very large extent, 4 for LE= large extent, 3 ME= moderate extent, 2 SE = small extent and 1 VSE= very small extent. In presenting the descriptive findings, mean values and standard deviation for each statement in the table was computed. For ease of interpretation and reporting the post-graduate students responses, the total number that chose very large extent and large extent was summed up to represent the agreement status, while the total number of those who chose very small extent and small extent was summed up to represent the disagreement status concerning empathy of digital institutional repository service provision. Table 4.7 gives a summary of the post-graduate student's responses gotten.

Table 4.7

Descriptive Results on Empathy

Statements on empathy (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
The staff in charge of the repository section gives me individual attention when I visit the site or the section	0	5(7.5%)	13(19.4%)	25(37.3%)	24(35.8%)	4.01	.929
The repository opening and closing hours are convenient for me	0	12(17.9%)	27(40.3%)	15(22.4%)	13(19.4%)	3.43	1.003
The repository section has best interest for their customers at heart	0	3(4.5%)	15(22.4%)	31(46.3%)	18(26.9%)	3.96	.824
My information needs are usually understood	1(1.5%)	3(4.5%)	18(26.9%)	35(52.2%)	10(14.9%)	3.75	.823
My information needs are usually attended to well	0	5(7.5%)	20(29.9%)	24(35.8%)	18(26.9%)	3.82	.920
I can assess the repository at any given time and place with my mobile phone or laptop	1(1.5%)	8(11.9%)	14(20.9%)	29(43.3%)	15(22.4%)	3.73	.994

Statements on empathy (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
The procedure for accessing information resources in the repository is brief, uncomplicated and quick	0	6(9.0%)	27(40.3%)	27(40.3%)	7(10.4%)	3.52	.804
The repository enable me to save my search results for future references	8(11.9%)	6(9.0%)	23(34.3%)	24(35.8%)	6(9.0%)	3.21	1.122
The websites has features such as reminding and suggesting me documents and resources based on my previous searches	10(14.9%)	19(28.4%)	21(31.3%)	12(17.9%)	5(7.5%)	2.75	1.146
I get notifications on new documents uploaded and published in the institutional repositories	21(31.3%)	20(29.9%)	20(29.9%)	6(9.0%)	0	2.16	.979
The repository manager in this university is caring about my information needs	2(3.0%)	7(10.4%)	14(20.9%)	36(53.7%)	8(11.9%)	3.61	.937
The repository manager in this university is concerned about my information needs	2(3.0%)	5(7.5%)	14(20.9%)	32(47.9%)	14(20.9%)	3.76	.971

Table 4.7 is indicating that post-graduate students were in agreement with most of the statements posed on empathy of digital institutional repository services at selected universities in Meru County, represented by a mean of 3.4 for most sentiments. The respondents strongly agreed that, the repository managers were granting them individual attention when they make a visit to the library section, 49(73.1%). Moreover, according to the students' responses, not all aspects on empathy were in place in the digital institutional repository sections at selected universities in Meru County. This is because, the mean values for indicators such as getting notification on new documents when published, ability of repository website to remind a student on previous searches and also saving downloaded items for future reference had mean values that were less than 3.4 and also a standard deviation of 1 and above.

High empathy levels was expressed in the statements like individual attention given to customers (mean = 4.01), staff best interest to serve repository users (mean = 3.96), well attending to customer information needs (mean = 3.82), individual concern of customer's needs (mean= 3.76) and good concern about customers' needs (mean = 3.75). Other aspects which determined empathy of institutional repositories were ability to have remote accessibility of the repository resources, the caring nature of the repository staff and concise information retrieval procedures for accessing the repository websites. However, the students expressed moderate concerns on the convenience of the repository operating hours (mean= 3.43).

The results are further indicating that, post-graduate students felt the state of empathy was satisfactory. This was indicated by the sense of agreement with most of the statements posed on empathy of digital institutional repository service provision at selected

universities in Meru County, where, the mean for a good number of the statements was more than 3.4. According to the students' responses, all aspects on empathy were regarded critical in determining digital institutional repository service provision at selected universities in Meru County. The aspects that indicated satisfactory were: individual attention, staff best interest, well attending, concern, attention and caring nature and of customer's needs. These results are appreciating the role of an institutional repository manager in providing appropriate services to students at university libraries. Apart from that, high empathy levels are expected from the service providers placed in the repository service points. These findings are agreeing with the recommendation of Parasuraman et al. (1985), the SERVQUAL model developer. Who expressed that, one way to enhance empathy to customers is by making the customer feel secure, loved, cared for, acknowledged, given attention and respected throughout the time when conversing, being guided or being served. Additionally, Psoma (2020) reported that, the ability of a staff in charge of a service point to make a customer comfortable when interacting with them explained a sense of empathy.

The findings are also illustrating the need to ensure possession of empathetic competencies by repository managers in university libraries. Noting that, empathy influences the understanding of customer's needs, it needs to be strengthened. Some of the practices for improving empathy include; training, professional development practices aimed at boosting customer care and handling mechanisms. This implores the university management to intervene through giving financial and managerial support, enforcing ethical, code of conduct and policies for strengthening customer service in libraries. Semo and Frissa (2020) also made similar observations in the University of Johannesburg where

they found the impact of leadership interventions in enhancing a culture of empathy. They explained that managerial interventions supported subordinate staff through improving their motivation and ironed their skills which led to better customer satisfaction. Heckaman's results of 2022 also echoed that, empathetic leadership exercised by the university librarian provided a bedrock for the development of empathetic employees.

The results are also showing, the students agreed that there was remote accessibility of the repository resources (mean= 3.73). This was one way to achieve the empathy level of repository services even during university library closure of business hours. In agreement, Saulus (2017) presented that empathy in repositories constituted the ease accessibility of the repository section and website. Some of the ways for achieving this was facilitating remote access to deposited collections using laptops and personal mobile devices, having flexible hours to favor customer visit and also having a library design which allows inclusive accessibility to the repository section. The results also brought to attention the need to strengthen the procedures for accessing, interacting and downloading relevant information material from the repository website. In doing so, this would assure regular accessibility by the students. This was in consensus with the observations of Psoma (2020) who persisted in ensuring e-resources are readily accessible remotely, the websites are quickly navigable, and that documents are downloadable.

The findings are also indicating that the respondents did not get notifications when new documents were published, the repository website failed to remind a student on previous searches and also the website lacked an option to save downloaded items for future reference. This indicates that the level of empathy on this aspects was low and this would affect their perceptions towards the digital institutional repository. It also had the potential

to influence the usability and accessibility of the services available on the platforms. This would eventually have an impact on the effectiveness of digital institutional repository services. These findings were not consistent with the report of Goshie et al. (2018) who reported that in Nigeria, ICT technologies had enabled learners to have remote access, download, and choose preferences when searching and reminding options of previous searchers done by an information seeker.

When post-graduate students were asked in an open-ended question to suggest what should be done to make digital institutional repository services empathetic, they provided thirteen suggestions. The study developed four themes out of the thirteen suggestions which cut across the provided responses. These were: ensuring daily function ability of the repository page, providing a repository user guide, shift to newer versions of the Dspace software and implement staff training and professional development. Moreover, student 59 wrote "*The library should organize for training for both staff and post-graduate students*".

These findings indicate that post-graduate students were aware of what was needed to be put in place in order to have empathy among digital institutional repositories. The suggestions inferred a need to check the function-ability of the repository webpage and link regularly, having quick access user guides and training the repository staff. The findings also reflected a need for the repository software to be upgraded to the latest version. These have implication on system librarians who is expected to regularly check the function-ability of the page as well as update user guides and quick access links in addition to upgrading of the software.

In the same note, the findings are suggesting a need for university management intervention through funding support to upgrade the software to a higher version with more experience

features. This has implication on budgeting. Trivedi and Bhatt (2019) also noted the contributions of relevant ICT infrastructure, facilities and software in improving the reliability of digital institutional repository services. The presented results are also pointing a need to embrace in-service employee training and professional development. This may be necessary to ensure quick responsiveness to user requirements when accessing the repositories. Alam and Mezbah-ul-Islam (2021) further elaborated that the facets which ensured the empathy of services was the presence of qualified and competent staff who are conversant with the needs of the customers, the services user are looking for, the information dissemination channels and management of the website.

Head of section librarians were also asked to describe the measures they had put in place to achieve empathy in repository services. From the responses given, it was noted that: they listen keenly to student's needs, offer solutions where needed, provide quick response to customer needs, adhere to library policies and practices; integrity, openness, honesty and also have short procedures for retrieving information materials in the repository. One head of section librarian added *"We usually check our dressing code and also abide by working ethics"* (L 08). Additionally, head of section 03 explained that "*we offer personalized assistance to students on one-on-one basis on how to access repository information resources"*. Another librarian remarked*, "We have implemented the open access standards, academic integrity and creative common licenses to protect the deposited works and also ensure we upload full text documents"* (L 06). These findings are in agreement with those of Goshie et al. (2018) who found that, prompt response, expression of politeness, eloquence, professionalism, competencies, adoption of ICTs and readily availability of customer care services improved the service provision and customer

satisfaction. Similarly, Lin et al. (2020) found that, empathy practices such as trustworthiness, responsiveness and quality of resources improved the usability of information materials published in repositories.

Moreover, during interviews librarians were requested to explain the influence of empathy in institutional repositories. Empathy was reported to influence digital repository service provision by increasing the access and usage of the site. Also, it promoted quality research and standardization, meeting of customer needs, better understanding of customer needs, makes staff more approachable and increased responsiveness. Another study that presented similar findings on the influence of empathy was Ranchordás (2021). Ranchordas observed that empathy stimulated organizational performance, attaining emotional intelligence, attaining effective leadership, user needs satisfaction and improved organizational corporate image. In support, Adeyeye (2023) presented that, empathy determined the achievement of responsiveness and customer loyalty.

4.9 Assurance of Digital Institutional Repository Serice Provision

The last objective (number five) of the study aimed to determine the assurance of digital institutional repository service provision at selected universities in Meru County. Assurance was evaluated to identify how it improves the provision of digital institutional repository service provision among post-graduate students. This objective was characterized by aspects including an experience of; courtesy, professionalism, competencies, security, credibility and trustworthiness by the information seeker towards the services being provided or the service provider. Opinions were gathered from the post-graduate students and the head of section librarians at universities in Meru County. Some of the aspects sought regarding assurance were; courteous nature of service provider,

knowledge and professionalism of repository manager, security features of the repository, compliance to academic integrity (plagiarism), compliance to intellectual property rights(creative common licenses), spelling suggestion to aid retrieval of accurate information, sense of confidence with the hosted resources, ability of services to satisfy user information needs and user friendliness of the repository website.

Post-graduate students were expected to respond to the statements by choosing their best opinions in a 5-level Likert rating scale. The ratings of each sentiment were: 5 represented VLE = very large extent, 4 for LE= large extent, 3 ME= moderate extent, 2 SE = small extent and 1 VSE= very small extent. In presenting the descriptive findings, mean values and standard deviation for each statement in the table was computed. For interpretation and reporting the post-graduate students responses, the total number that chose very large extent and large extent was summed up to represent the agreement status, while the total number of those who chose very small extent and small extent was summed up to represent the disagreement status concerning assurance of digital institutional repository service provision. Table 4.8 gives a summary of the post-graduate student's responses gotten.

Table 4.8

Descriptive Results on Assurance

Statements on assurance (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
The employee in the repository section is courteous with customers	1(1.5%)	1(1.5%)	10(14.9%)	30(44.8%)	25(37.3%)	4.15	.839
The employee in charge of institutional repository is very rich in knowledge	0	1(1.5%)	29(43.3%)	24(35.8%)	13(19.4%)	3.73	.790
The institutional repository has adequate security features	0	7(10.4%)	26(38.8%)	27(40.3%)	7(10.4%)	3.51	.823
In the institutional repository, (plagiarism) academic integrity is complied with	3(4.5%)	3(4.5%)	10(14.9%)	21(31/3%)	30(44.8%)	4.07	1.091

Statements on assurance (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
institutional repository comply to creative common licenses	4(6.0%)	6(9.0%)	15(22.4%)	22(32.8%)	20(29.9%)	3.72	1.165
The repository web-site has spelling suggestion to assure retrieval of accurate information	8(11.9%)	22(32.8%)	19(28.4%)	12(17.9%)	6(9.0%)	2.79	1.149
The repository managers has knowledge, skills and competencies	0	4(6.0%)	34(50.7%)	16(23.9%)	13(19.4%)	3.57	.874
I have a lot of confidence in the information services in the institutional repository	1(1.5%)	5(7.5%)	24(35.8%)	24(35.8%)	13(19.4%)	3.64	.933
The repository website is user friendly	3(4.5%)	7(10.4%)	23(34.3%)	24(35.8%)	10(14.9%)	3.46	1.020
The information in the repository satisfies my information needs	3(4.5%)	11(16.4%)	23(34.3%)	18(26.9%)	12(17.9%)	3.37	1.099

Table 4.8 is showing that post-graduate students were in agreement with most sentiments regarding assurance represented by mean values which were greater than 3.4. Specifically, there was high agreement on the courteous nature of repository staff (mean = 4.15), compliance to academic integrity/plagiarism (mean= 4.07), knowledge and professionalism of repository manager (mean = 3.73), repository website always bringing relevant answers to search terms (mean= 3.75) the repository website returning feedback results immediately after executing a search (mean =3.73), compliance to intellectual property rights (creative common licenses), (mean = 3.72) and a sense of confidence with the hosted resources(mean= 3.64) However, a sizeable number of students disagreed that the repository web-site has spelling suggestion to assure the retrieval of accurate information (mean= 2.79). There was however moderate user-friendliness of the repository website, (mean=3.46). Besides, post-graduate students felt that the information they retrieved from the repository moderately satisfied their information needs.

The above results have presented that the ratings from post-graduate students on various aspects regarding assurance were largely moderate. This hinted on the importance of each assurance indicator in influencing digital institutional repository service provision. The results agreed with the opinions of Frahm-Arp et al. (2020) who reported that, assurance is demonstrated through a number of dimensions which include employee etiquette, ethics and conduct, customer security and employee competencies. Similarly, Salam et al. (2018) also opined that friendliness, consideration, knowledgeable, skilled, honest, security, believability, freedom from risk and also credibility features demonstrated high possession of assurance among repository managers.

The results have indicated that university libraries were making reasonable efforts to boost assurance of digital institutional repository services at universities in Meru County. Some of the noted assurance aspects that were being practiced include: courteous nature of repository staff and compliance to academic integrity standards such as plagiarism. The aspects of assurance that were noted to be influential in digital institutional repository service provision, required to be strengthened among selected university libraries in Meru County. Undoubtedly, assurance is essential in meeting the information needs of a customer hence, staff competency/professional development, relevancy of website results returned, duration for website to give feedback results after executing a search, spelling suggestion when searching the repository, compliance creative common licenses and a sense of confidence with the hosted resources needs to be strengthened. Doing this, requires upgrading of the repository software to a latest version with addition efficient features. Comparably, Psoma (2020) explained that the repository software can depict assurance with the ability of the database to retrieve and download searched materials, the ability of the system to provide spelling suggestion and alternative searches, possession of adequate security features of the systems and also perceived user trust of the web pages. In support, Asadi et al. (2019) also reported agreeing findings that the choice of a software influenced the extent of meeting user needs, cost effectiveness and reliability.

The findings also point out a need to invest in in-service training to enrich repository professionals with relevant competencies, skills, knowledge and professionalism. Without doubt, in the United States of America, similar approaches have been exercised by investing in employee's competencies, offering specialized courses and conducting customer care trainings (Fraser-Arnott, 2016). James et al. (2015) also acknowledged the

131

input of competencies and knowledge as professional assets for informing trustworthy, dependability and reliability of needed services. Moreover, in order to instil confidence among post-graduate students on the relevancy of open access collections in the repository, there is room for the universities to undertake advocacy practices so as to make respondents aware of the services on offer and their benefit to scholarly research. Mwiti (2017) also noted the contribution of creating user awareness to information services at their disposal among institutional repositories in Kenya. To sum this up, a combination of these practices calls for standardization through a policy to guide attainment of assurance aspects in repositories.

Considering that assurance is a key factor in improving digital institutional repository service provision among post-graduate students; the elements of assurance have pointed out opportunities for university library websites are endowed with modern information retrieval features such as spelling suggestions, aesthetic discoverable tools/features in order to upscale digital repository service provision.

In order to address this challenge, the respondents were asked in an open-ended question to suggest what should be done to improve assurance in service provision. Students provided several suggestions out of which three themes were developed. These were: carry out awareness to assure relevancy of deposited collections, conduct staff training and upgrade repository technology. The adoption of the suggested practices would lead to improved assurance which ultimately upgrades the utilization and effectiveness of service provision in digital institutional repositories at universities in Meru County. In agreement, Nakitare et al. (2020) reported the role of funding, professional development and

advancement of technologies as strong remedies to improve utilization of repositories in university libraries.

These findings indicate that post-graduate students were aware of what was needed to be put in place in order to have assurance among digital institutional repositories. These have implication on the need for a system librarians who will regularly check the function-ability of the page as well as update user guides and quick access links.

In the same note, results are suggesting a need for university management intervention through funding support to upgrade the software to a higher version with more experience features. This has implications on budgeting. Trivedi and Bhatt (2019) also noted the contributions of relevant ICT infrastructure, facilities and software in improving the reliability of digital institutional repository services. The presented results are also pointing a need to embrace in-service employee training and professional development. This may be necessary to ensure quick responsiveness to user requirements when accessing the repositories. Alam and Mezbah-ul-Islam (2021) further elaborated that the facets which ensured the empathy of services was the presence of qualified and competent staff who are conversant with the needs of the customers, the services user are looking for, the information dissemination channels and management of the website.

In the interview conducted with the head of section librarians, a question was posed which required them to explain how they assured institutional repository services. The librarians responded that they assured customers by: publishing articles in the site on time, opening section during operational hours, ensuring accessibility of physical resources and by uploading full text documents. Librarian number 05 added that, *"We have communication channels which enable users to submit their queries"* Moreover, the librarians promoted

assurance by: checking documents for plagiarism and uploading peer review resources in the repository software. These suggestions were agreeing with the recommendations given out by the post-graduate students hence, need to strengthen aspects that communicate assurance value of a service.

When heads of sections were asked to explain the ways in which assurance contributed to improvement in institutional repository service provision in university libraries, the responses showed the existence of influence. Some of the ways noted from the recorded interview were: assurance influenced the visibility of the institution, increased usability of services, improved students confidence on the resources offered, created long-term customer relationships and increased satisfaction of user needs. This was also acknowledged by Janse van Vuren (2022) who found that, assurance enables libraries to maintain potential repository users, meet their needs satisfactory, improve operational efficiency, improved institutional image and branding, earn organizational performance, improve quality service delivery and manage monitoring and evaluation through customer feedback.

The results from head of section librarians were majorly consistent with the post-graduate students'. Findings put much emphasis on assuring post-graduate students by meeting their needs satisfactory, training them on how to access published content, developing competencies of repository staff, guarantying security, ensuring credibility, winning their trust and offering quality information services. Studies such as Fraser-Arnott (2016), James et al. (2015) and Khan and Sheikh (2023) have also explained the role of customer assurance in improving service provision.

4.10 Digital Institutional Repository Service Delivery Provision

Digital institutional repository service provision at university libraries in Meru County was the dependent variable in this study. Opinions regarding this variable was gathered from post-graduate diploma, masters and PhD students and the head of sections librarians at universities in Meru County. In this study, concurrent- embedded design of mixed method was adopted where, quantitative data collected through questionnaires from the post-graduate students was presented descriptively through tables and then followed by an integration of qualitative data from the open-ended questions and the head of section librarian interviews. A similar approach was implemented to analyze, present and discuss the rest of the variables of the study.

Regarding digital institutional repository service provision, 10 statements were posed to post-graduate students where they were required to indicate their opinions in a 5-level Likert rating scale. These responses were helpful in determining the status of digital institutional repository service provision in university libraries. The sentiments posed to the post-graduate students were based on the identified service provision indicators. These included; reliability, responsiveness, tangibility, empathy, assurance, infrastructure and facility adequacy, librarian's etiquette, accessibility of services and timeliness in service provision. In conducting the descriptive analysis, mean values, standard deviation, frequencies and percentages were generated for each statement in the descriptive table.

In measuring the digital institutional repository service provision at university libraries, the post-graduate students were asked to indicate the extent to which they agreed or disagreed with each service provision sentiment presented in a table; where, VLE = very large extent (5), LE= large extent (4), ME= moderate extent (3) SE = small extent (2) and VSE= very

small extent (1). For interpretation and reporting the descriptive results from post-graduate students, the total number that chose very large extent and large in the likert scale was summed up to represent the agreement status. The total number who chose very small extent and small extent in the likert scale was summed up to represent the disagreement status concerning service provision. A summary of the post-graduate student's responses is presented in Table 4.9.

Table 4.9

Digital institutional repository service provision

Statements on service delivery in institutional repositories (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
Reliability aspects of the institutional repository services increase1 user satisfaction in our institution	1(1.5%)	1(1.5%)	9(13.45)	33(49.3%)	23(34.3)	4.13	.815
Responsiveness of institutional repository service increase satisfaction in our institution	0	5(7.5)%	10(14.9%)	31(46.3%)	21(31.3%)	4.01	.879
Tangibility of institutional repository services increase user satisfaction in our institution	1(1.5%)	4(6.0%)	13(19.4%)	25(37.3%)	24(35.8%)	4.00	.969
Empathy of institutional repository service increase user satisfaction in our institution	1(1.5%)	4(6.0%)	12(17.9%)	25(37.3%)	25(37.3%)	4.03	.969
Assurance of institutional repository service increase user satisfaction in our institution	0	3(4.5%)	13(19.4%)	28(41.8%)	23(34.3%)	4.06	.851

Statements on service delivery in institutional repositories (N=67)	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)	Mean	Std. Deviation
There are adequate infrastructures, facilities and reading areas in of institutional repository service in our institution	4(6.0%)	31(46.3%)	20(29.9%)	8(11.9%)	4(6.0%)	2.66	.978
The institutional repository staff are polite, courteous and respectful	1(1.5%)	4(6.0%)	9(13.4%)	25(37.3%)	28(41.8%)	4.12	.962
The institutional repository services are accessible at all times	1(1.5%)	6(9.0%)	36(53.7%)	15(22.4%)	9(13.4%)	3.37	.885
Institutional repository services are essential in	0	3(4.5%)	10(14.9%)	30(44.8%)	24(35.8%)	4.12	.826
There is no sluggishness in service delivery at institutional repository services in out institution	0	6(9.0%)	26(38.8%)	25(37.3%)	10(14.9%)	3.58	.855

The results presented in Table 4.9 show that post-graduate students reported high agreement level on the need for service provision to be reliable (mean = 4.13), etiquette, politeness and courtesy (mean = 4.12), assurance of services (mean = 4.06), empathy (mean = 4.03) responsiveness (mean = 4.02) and tangibility aspects. All these aspects were considered most essential in influencing post-graduate institutional repository services at university libraries. Other aspects that influence digital institutional repository service provision was promptness and timeliness when offering services. However, 31(46.3%) of the students felt that the digital institutional repository section did not have adequate infrastructure, facilities and furniture such as reading areas, leave alone the fact that repository services were ranked essential in guiding research, development and learners performance (mean= 4.12).

The results from post-graduate students, have narrowed down on reliability, responsiveness, and tangibility, empathy and assurance aspects as influential in digital institutional repository service provision. Alam (2021) presented findings which were consistent with the report of this study which established that, tangibility and responsiveness were important facets for improving digital institutional repository services among university libraries. In agreement, Bandara et al. (2021) also identified that satisfactory service delivery among library institutional repositories depended on the caring nature of the staff, their competencies, skills, responsiveness, and reliability, adequacy of resources and tangibility of the library resources, services and facilities.

Notably the interview conducted on the head of section librarians required them to state the main drawbacks to achieving effective digital institutional repository service provision at Universities in Meru County. Some of the noted challenges were: slow growth of

repository collections, lack of enough financial allocation, inadequate modern technology, limited sensitization and awareness, digital illiteracy among repository managers, open access issues, publishing of articles abstract other than full texts documents and limited literacy on customer handling. In support to the findings, Trivedi and Bhatt (2019) and Hossain (2016) also noted repositories in western countries were facing challenges related to apprehension to infringe publisher copyrights, limited awareness, gaps between customer's specifications and expectations, limited responsiveness and limited customer assurance are evident. Moreover, Gathoni and Van der Walt (2019) noted that limited courtesy by employees, nature of physical resources, changing expectations of users and budgetary limitations were challenges that hindered effective service delivery. The heads of sections were henceforth asked to suggest ways for improving service provision in repositories. Few themes were derived from the 20 suggestions. The themes were: conducting training and competency development programs, increase library annual budget, marketing and sensitization services and adopting modern technology.

When post-graduate students were asked in an open-ended question to suggest what should be done to improve digital institutional repository service provision in university libraries, they provided ten suggestions. The study developed themes out of the ten suggestions which cut across the responses. These were: sensitization and marketing of the services offered, embracing student/staff capacity building practices, purchasing infrastructure and new technologies, and extension of repository working hours.

The above results show high level of agreement between post-graduate students and librarians responses. From the challenges stated, the study noted the need for university libraries to put mechanisms in place in order to have effective service provision in digital

institutional repositories. The suggestions inferred a need to have regular awareness, sensitization and marketing programs to enlighten them on the services being offered in the repositories. Such suggestions were intended to make students aware on the services available and how to access them. Kayungi et al. (2021) in South Africa also reported that awareness and possession of knowledge on how to access published materials in institutional repositories through seminars, orientations, workshops and one-on one basis improved usability and accessibility to the deposited items. Moreover, Ratanya (2017) also supported the presented findings in their report stating that; trainings and marketing initiatives to customers led to the achievement of improved service utilization in libraries. The findings have also underscored the need to strengthen staff capacity building practices so as to improve repository service provision. Head of section librarian 01 emphasized, *"The university librarian should push for head of section trainings, workshops, benchmarking activities and attendance of conferences".* These results have implication on staff professional development, retooling and skills sharpening in order to remain relevant in the provisioning of services. The same was also noted by MacIntyre and Jones (2016) in the United Kingdom, who found the necessity to enhance repository manager's capacities through trainings on customer care and customer handling.

Moreover, the study identified the need for developing and upgrading the repository technology, furniture and infrastructure. In addition, another library head of section said, *"We need scanners for digitizing resources, student's computers to enable them download repository articles and enough reading tables in the repository section"* (L 02). The librarian also added that, the Dspace software they were using needed to be upgraded to the latest version. This implies the need for the university management to chip in through

financial allocation and budgeting so as to acquire student's computers, establish comfortable reading areas and for supporting the upgrading of Dspace software. The findings are in agreement with the observation of Alam (2020) and Karim (2018) on the need for quality facilities for student's utilization. The key aspects featured in their findings included; securing reading furniture, ICT infrastructure, updating the collections and digitization of existing collections to enhance accessibility.

Other areas of concern presented by the results was the need to improve the flexibility of institutional repository services by increasing the operation hours. No wonder, there was a concern about the accessibility of the digital institutional repository sections for patrons who wish to utilize the section physically. In that connection, university libraries need to readdress their opening and closing hours of digital institutional repository section as well as employ more staff in order to ensure accessibility of repository sections in university libraries.

4.11 Testing Overall Applicability of SERVQUAL Model in DIRs

Having established the status of elements of SERVQUAL model in the preceding discussion, it was necessary to assess the composite applicability of the model. In order to test the overall applicability of SERVQUAL model in digital institutional repository service provision, diagnostic tests were first carried out to help the researcher to select the appropriate inferential analysis techniques to be used; either parametric or nonparametric test. Initially, the study had purposed to use regression analysis and therefore, it was necessary to ascertain the specific type of regression analysis that was suitable. The findings on diagnostic tests on assumptions of regression analysis were presented from the post-graduate student's data as follows.

4.11.1 The normality test

The questionnaire data collected was presumed to be drawn from post-graduate students'

target population which were normally distributed. In order to ascertain this, a normality

test was carried out to rule out any kind of violation. The study, used Shapiro-Wilk test to

obtain the P-value since the sample population was less than 100. Additionally, a histogram

was also adopted to determine the extent of skewness. The results on Shapiro-Wilk test are

presented in Table 4.10.

Table 4.10

Shapiro-Wilk Tests of normality on SERVQUAL Model and DIR Service Provision

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
X1	.160	67	.000	.930	67	.001
X2	.097	67	.195	.967	67	.069
X3	.142	67	.002	.962	67	.040
X4	.103	67	.076	.978	67	.274
X5	.130	67	.007	.966	67	.067
Y	.091	67	.200*	.975	67	.192

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The findings in Table 4.10 indicate that the Shapiro-Wilk P-values for the variables are

insignificant, P-value is greater than 0.05 level of significance. This shows that the

population was normally distributed. A further diagnostic test of normality using graphical

method was generated to counter-confirm the normality conditions particularly on the

dependent variable Y; digital institutional repository service provision. The outcome is

presented in Figure 4.1.

Figure 4.1

Histogram on digital institutional repository service provision
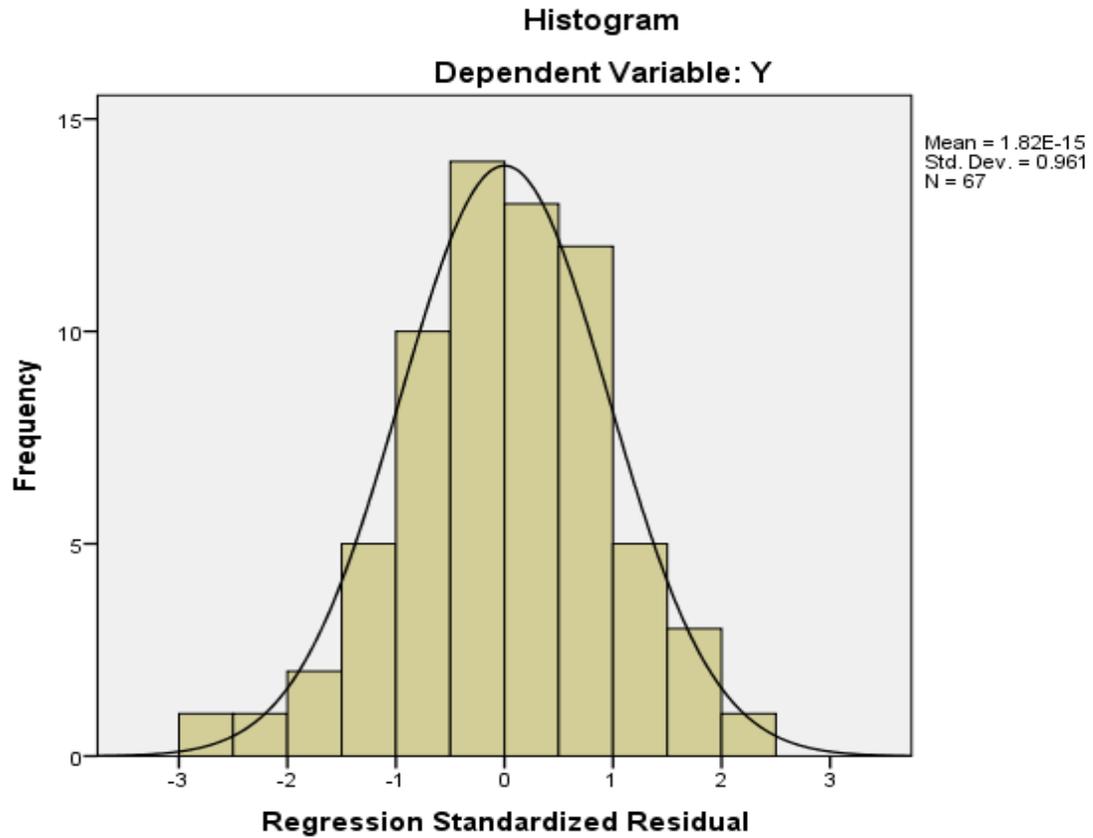
According to the histogram presentation in Figure 4.1, there is minimal skewness in the manner in which post-graduate student's data is distributed. However, the slight skewness was not interfering with the normal distribution of the student's data. The same is demonstrated in box plots in Figure 4.2.

Figure 4.2

Box plot on digital institutional repository service provision
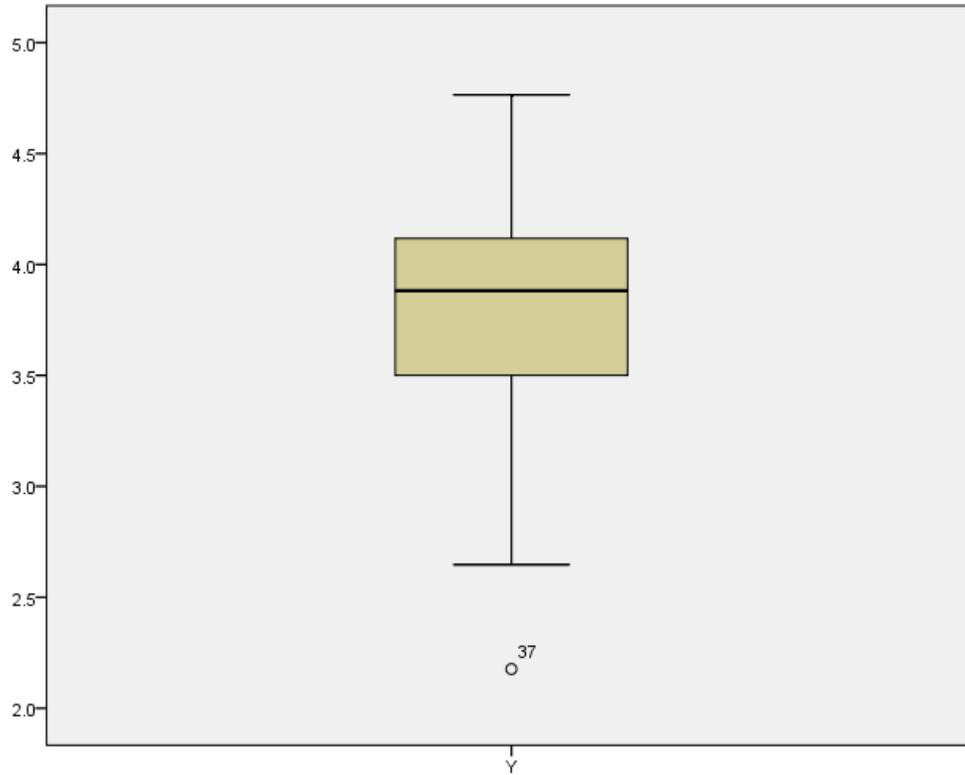
Figure 4.2 demonstrates that, the whiskers in the box plot have slight skewedness. However, the observed level of skewedness possesses insignificant deviation; hence, data was normally distributed. Noting that the study had initially contemplated to regress the SERVQUAL Model, other data conditions including; linearity, heteroscedasticity, autocorrelation and multicollinearity were also checked. The next section provides observations on linearity test.

4.11.2 The Linearity Test

The linearity of the data for the SERVQUAL model constructs was ascertained by generating the ANOVA table and a scatter plot and the same is presented in Table 4.11 and Figure 4.3.

Table 4.11

Linearity Tests

ANOVA table

			Sum of Squares	df	Mean Square	F	Sig.
Y * SERVQUAL_MODEL	Between Groups	(Combined)	15.599	44	.355	3.553	.001
		Linearity	7.510	1	7.510	75.252	.000
		Deviation from Linearity	8.090	43	.188	1.885	.056
	Within Groups		2.196	22	.100		
	Total		17.795	66			

Table 4.11 shows linearity is represented by a significant value of .000 for the SERVQUAL Model constructs and institutional repository service provision where, the level of linearity is significant as indicted by a significant p value (P<0.05). Moreover, the deviation from the linearity is .056; which is insignificant (P>0.05); hence, it does not deviate from a normal distribution. Therefore, the post-graduate data had no linear problem. This was counter-confirmed with the scatter plots in Figure 4.3.

146

Figure 4.3

Scatter plots for Post-Graduate Data
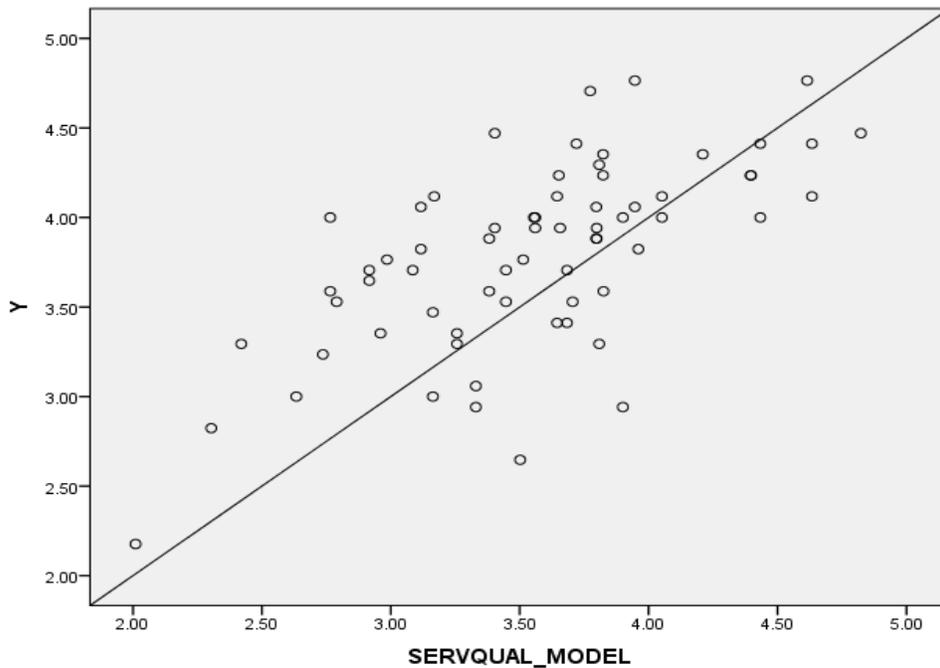
The scatter plots is indicating that most data points are spread near the line of best fit. Therefore, there is a linear dependency between the predictor variables and the dependent variable.

4.11.3 The Autocorrelation Test

Autocorrelation assumption was checked using Durbin-Watson statistics. The Durbin-Watson values in Table 4.12 are more than 0.8 as explained by Singh (2007) and Gupta (2000), that durbin-Watson values greater than .8 shown no autocorrelation in the data.

Table 4.12

Autocorrelation tests results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson value
X1	.537[a]	.288	.277	.44153	1.748
X2	.511[a]	.261	.250	.44965	1.379
X3	.584[a]	.340	.330	.42492	1.608
X4	.627[a]	.394	.384	.40742	1.450
X5	.608[a]	.370	.360	.41528	1.414

a. Predictors:(Constant),X1, X2, X3, X4, X5

b. Dependent Variable: Y

As presented in table 4.12, Durbin-Watson values were: 1.748, 1.379, 1.608, 1.450 and 1.414 for X1, X2, X3, X4, and X5 respectively. The data from post-graduate students therefore indicated no autocorrelation between the SERVQUAL models constructs.

4.11.4 The Multicollinearity Test

The compliance of data to multicollinearity condition before conducting regression was also counter confirmed by computing the Variance Inflation Factor (VIF) values of the independent variables. The results are presented in Table 4.13.

Table 4.13

Multicollinearity tests results

Model	Unstandardized coefficients		Standardized coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
Constant	1.624	.340		4.773	.000		
X1	.136	.131	.187	1.036	.304	.273	3.669
X2	-.109	.145	-.146	-.757	.452	.237	4.219
X3	.176	.155	.177	1.139	.259	.366	2.733
X4	.237	.133	.296	1.782	.080	.322	3.105
X5	.176	.135	.236	1.303	.198	.271	3.689

a. Dependent Variable: Y

Table 4.13 demonstrated that all the elements of the SERVQUAL model had no multicollinearity problem. This is indicated by VIF that is less than 5 for all the five constructs of the study (Cooper & Schindler, 2011). This flow of findings permitted the application of parametric inferential statistics for testing the overall applicability of SERVQUAL model in the study since there was no multicollinearity problem.

4.11.4 The Heteroscedasticity Test

The study utilized a scatter graph method to check heteroscedasticity problem. This was by checking if the collected data produced a given pattern before proceeding to do a regression analysis. The output is presented in Figure 4.4.

Figure 4.4

Heteroscedasticity test results

Scatterplot
Dependent Variable: Y
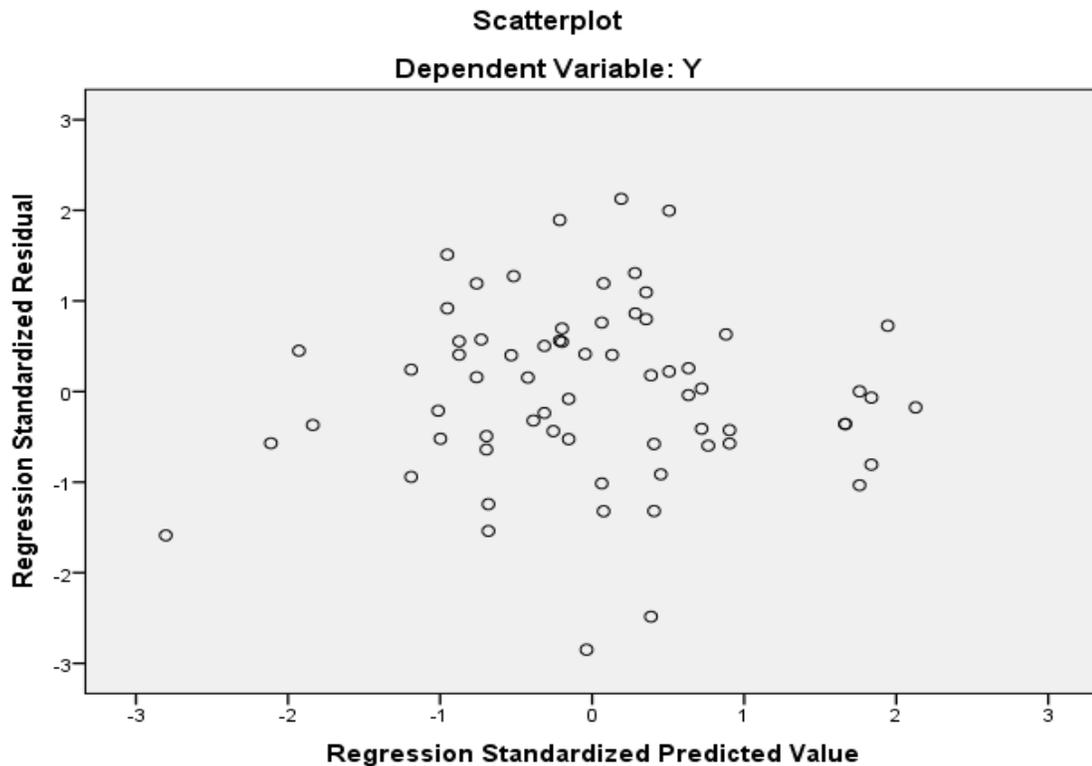
The findings demonstrated that the scatter points are dispersed in the scatter graph without any defined pattern. These results confirm the absence of heteroscedasticity problem in the data; hence, the adoption of multiple regression analysis to test the application of SERVQUAL model in digital institutional repositories at selected university libraries in Meru County. This was agreed upon confirming the non-violation of other conditions including; normality, linearity, autocorrelation and multicellularity.

Therefore, the impacts of the elements of SERVQUAL model (reliability, responsiveness, tangibility, empathy and assurance) on digital institutional repository service provision was

tested using a multiple linear regression analysis. In interpreting the applicability of the model, R-Square-values were utilized to gauge the strength of the influence between reliability, responsiveness, tangibility, empathy, assurance (when combined in one model) on digital institutional repository service provision. For the level of statistical significance, the ANOVA Table (4.14) generated was helpful in determining this aspect, and confirm model validity. The first results presented is model summary.

Table 4.14

Model summary results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.816[a]	.666	.638	.38439

a. Predictors: (Constant), X5, X1, X3, X4, X2
b. Dependent Variable: Y

Table 4.14 shows that when SERVQUAL model [reliability(X1), responsiveness(X2), tangibility(X3), empathy(X4) and assurance(X5)] are regressed in a single model, they show a positive correlation with the digital institutional repository service provision (dependent variable); the R-value is 0.816; while, the R-square value (R^2= 0.666). This indicate that the five predictor variables explain for 66.6% of the variation in the digital institutional repository service provision. Table 4.15 presented the ANOVA results which were utilized to test the model validity.

Table 4.15

ANOVA results on the SERVQUAL Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.942	5	3.588	24.286	.000[b]
	Residual	9.013	61	.148		
	Total	26.955	66			

a. Dependent Variable: Y
b. Predictors: (Constant), X5, X1, X3, X4, X2

The results on SERVQUAL model validity, in the ANOVA Table 4.15, reveal that the model is very valid and, henceforth, an excellent match to the post-graduate students data; $(F_{(5,61)} = 24.286$, P.000). This meant that reliability, responsiveness, tangibility, empathy and assurance comprised a statistically significant model for explaining the influence on digital institutional repository service provision at universities in Meru County. The regression coefficients were estimated to indicate how changes in the independent variable caused changes in the dependent variable. The regression weights for each predictor variable in the combined model as shown in Table 4.16.

Table 4.16

Regression Weights Results of the Model

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.599	.329		1.822	.073		
	X1	.180	.127	.201	1.419	.111	.273	3.669
	X2	-.047	.140	-.051	-.335	.739	.237	4.219
	X3	.242	.150	.198	1.618	.161	.366	2.733
	X4	.134	.129	.136	1.040	.302	.322	3.105
	X5	.394	.131	.429	3.015	.004	.271	3.689

a. Dependent Variable: Y

The results in Table 4.16 show that the regression coefficients for each predictor variable in the model. The unstandardized B-coefficient values are; X1= .180, X2=.-0.47, X3= .242, X4= .134, X5= .394. The results indicate that P-values for X_1, X_2, X_3, and X_4 were insignificant, but X_5 had significant P-value. In interpretation, P<0.05 was utilized to gauge the magnitude of significance. The findings opine that although the five predictor variables are jointly statistically significant in the combined regression model in accounting for variation initial institutional repository service provision at universities, it is assurance which exerts more influence. The other predictors cease to be significant in the combined model (P>0.05), although they essential.

Conclusively, the initial regression model was confirmed. That is,

$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + e$, where:

Y= Digital institutional repository service provision

β_0 = Constant

β_1, β_2, β_3, β_4, β_5 = regression coefficient weights for x_1, x_2, x_3, x_4, x_5 as shown below:

X_1 = Reliability

X_2 = Responsiveness

X_3 = Tangibility

X_4 = Empathy

X_5 = Assurance

ε = is the estimated error of the model.

The resulting multiple linear regression model is:

Institutional repository service provision $= .599 + .180X_1 + -.047X_2 + .242X_3 + .134X_4 + .394X_5 + e$

The resulting multiple linear regression model shows that digital institutional repository service provision= $(.180X_1$ reliability$)$ + $(-.047X_2$ responsiveness$)$ + $(.242X_3$ tangibility$)$ + $(.134X_4$ empathy$)$ + $(.394X_5$ assurance$)$ +.599$). In this model, .599 is the threshold value which is linked to the SERVQUAL model constructs. This implies that .599 is equal for each SERVQUAL variable. Furthermore, the presented results demonstrate that reliability(X_1), responsiveness(X_2), tangibility(X_3), empathy(X_4) and assurance (X_5) form a model that is statistically significant in determining digital institutional repository service provision at University libraries in Meru County. However, in the combined model, it is assurance that is statistically significant (X_5), $(\beta_1 = .394, p = .004)$. After assurance is reliability(X_1), $(\beta_1 = .180, p = .111)$, tangibility$(X_3)$, $(\beta_3 = .242, p = .161)$, empathy$(X_4)$ $(\beta_4 = .134, p = .302.)$ and (X_2) $(\beta_2 = .134, p = .388.)$ in the model. The results underscore the influence of SERVQUAL model constructs on digital institutional repository service provision. More unto that, all the five variables are jointly exerting a lot of pressure on digital institutional repository service provision among post-graduate students at university libraries in Meru County. However, the influence of assurance aspect is the one that was very weighty as compared to reliability, tangibility, empathy and responsiveness. Studies by Saulus (2018), Saulus et al. (2017), Karim (2018), Alam (2021), Trivedi and Bhatt (2019) and Bandara et al. (2021) adopted SERVQUSL model to underpin its applicability in libraries and common to all, reliability, responsiveness, tangibility, empathy and assurance were reported to influence service provision in libraries.

154

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the entire study by providing an overview of the reported findings, conclusions and henceforth provide amicable reccomendations. The study was set out to assess how application of the SERVQUAL model improves the institutional repository services offered by libraries to post-graduate students at universities in Meru County. This was established by determining the reliability, responsiveness, tangibility, empathy and assurance of digital institutional repository service provision at selected universities in Meru County. The study utilized the SERVQUAL model to underpin the investigated phenomena. Also, a concurrent- embedded design and mixed methods was utilized to obtain data from a sample size of 101 respondents which comprised 91 post-graduate students and 10 head of section librarians. The students were issued with the post-graduate questionnaire while the head of section librarians were interviewed. Descriptive and multiple linear regression analysis were employed on quantitative data while thematic analysis on qualitative data. The chapter also presents recommendations worth considering for further studies.

5.2 Summary of Findings of the Study

The study achieved an overall response rate of 75.2%, which constituted 67(73.0%) post-graduate students and 9(90%) head of section librarians which was adequate for the study. Besides, the obtained data was reliable as presented by Cronbach's alpha values that were greater than .700 for all the variables. Next sub-section covers the demographic profiles of post-graduate students and head of section librarians. The main variables of study are also

summarized starting with: digital institutional repository service provision, reliability, responsiveness, tangibility, empathy and assurance respectively.

5.2.1 Background Information of Respondents

The study indicated that there were more female than male post-graduate students at universities in Meru County. Majority of the post-graduate students 48(71.6%) were pursuing their masters degrees; 10(14.9%) said were doing post-graduate diploma, while only 9(13.4%) were pursuing doctorate degrees. Results indicated that post-graduate student' gender was balanced and that, most learners enrolled were undertaking their master's degree. Most head of section librarians had adequate experience on service provision in digital institutional repositories among university libraries.

5.2.2 Reliability of Digital Institutional Repository Service Provision

The first objective determined the reliability of digital institutional repository service provision at selected universities in Meru County. The findings of the study noted that libraries in Meru County had established practices and measures to ensure reliability of services. For example, librarians ensured dependability of the collection, visibility of the repository page, accuracy of the information resources and up-to-datedness of the collection. Furthermore, the university libraries ensured they offered services as promised during trainings and orientations. However, the areas noted as requiring improvement were: ensuring daily function ability of the repository page, accessibility of the repository section during the destined opening hours and timeliness in service provision. The study noted that overcoming the challenges required librarians to check the function-ability of the repository webpage and link regularly, extend the physical section opening hours and securing ICT infrastructure and facilities like stable internet bandwidth, wifi and students

computers to enable learners to utilize the repository. According to the results, the extent of reliability of digital institutional repository services to post-graduate students at selected universities in Meru County was satisfactory.

5.2.3 Responsiveness of Digital Institutional Repository Service Provision

This was the second objective which aimed to determine the responsiveness of digital institutional repository service provision at selected universities in Meru County. The results of the study indicated that responsiveness aspects in the repositories was ensured through staff etiquette, courtesy, politeness and willingness to help customers. Moreover, staff were attentive to customer needs and the repository website always brings relevant feedback immediately after executing a search. The study further noted that the repository staff timely respond to customer needs. However, there lacked feedback platforms for submitting queries such as WhatsAapp a repository manager and talk to a repository manager and repository user guides. Similarly, the post-graduate students noted that responsiveness could be ensured by embracing suggestions which inferred a need to have customer feedback tools such as WhatsApp a repository manager, feedback goggle forms, chat a repository manager, quick links, page guiding tours, user guides, navigation panes and email a repository manager. Apart from that, post-graduate student's trainings and employment of more institutional repository managers was reported to improve responsiveness. In answering research question two, the study found that, responsiveness in digital repositories was satisfactory.

5.2.4 Tangibility of Digital Institutional Repository Service Provision

The third objective was to examine the influence of tangibility on digital institutional repository service provision at selected universities in Meru County. The findings of this study indicated that the tangibility of digital institutional repository service provision was moderate. Tangibility was observed by ensuring staff are neat in appearance, information resources are well organized in the repository, and published resources are easily downloadable and good arrangement of section physical facilities. Regardless of the established tangibility mechanisms, respondents expressed a need to address the appearance of physical resources, adequacy of infrastructure, information resources, and physical facilities and include post-graduate diploma research projects in the repository. The condition was regarded to affect the institutional repository study environment, which had the potentials to affect effective service provision. The study further noted significant practices that librarians had effected to improve the tangibility of services. The libraries had implemented policies and procedures guiding security of information, had acquired DSpace software and populated the repository with graduates annually. Also, the repository managers open the repository section during working hours, ensure that the website is working, shelving of repository resources and classification of repository information materials. Tangibility extend in digital institutional repositories was moderate.

5.2.5 Empathy of Digital Institutional Repository Service Provision

The fourth objective was determining the empathy of digital institutional repository service provision at selected universities in Meru County. Six aspects of empathy were noticed which had influence on digital institutional repository service provision. The aspects included individual attention given to customers, staff best interest to serve repository users, attention to customer information needs, concern of customer's needs, remote

accessibility of the repository resources, the caring nature of the repository staff and concise information retrieval procedures. Several measures were put in place to ensure empathy at university libraries in Meru County. These were: listening keenly to student's needs, offering solutions where needed, provide quick response to customer needs, adhere to library policies and practices; integrity, openness, honesty, work ethics, code of conduct and also short procedures for retrieving information materials in the repository. Regardless, the findings indicated that respondents did not get notifications when new documents were published, the repository website failed to remind a student on previous searches and also the website lacked an option to save downloaded items for future reference. Apart from that, empathy level in the institutional repository was satisfactory.

5.2.6 Assurance of Digital Institutional Repository Service Provision

The study further assessed the last objective on the assurance of digital institutional repository service provision at selected universities in Meru County. The results of the study noted that empathy aspect was a key element in digital repositories. This amplified the need for repository managers to have requisite knowledge, competencies, and skills managerial to assure their customers. The study also identified that, courtesy, academic integrity standards, relevant answers to search terms, immediately feedback on executing a search, compliance to intellectual property rights creative common licenses and a sense of confidence with the hosted resources assured customers. Effective assurance was curtailed by lack of modern information retrieval features such as spelling suggestions, aesthetic discoverable tools/features for up scaling digital repository service provision. The situation was blamed on limited awareness, staff training and upgrade repository

technology. The study noted that the level of assurance in digital institutional repositories at universities in Meru County was moderate.

5.2.7 Digital Institutional Repository Service Provision at Universities in Meru County

Digital institutional repository service provision was the dependent variable in the study. It was noted that ten factors were influencing digital institutional repository service provision. The factors that were considered most essential in influencing post-graduate institutional repository services at university libraries were; reliability, etiquette, politeness and courtesy, assurance, empathy, responsiveness, tangibility, promptness and timeliness. However, digital institutional repository service provision was facing challenges attributed to inadequate infrastructure and facilities, limited repository collections, inadequate financial allocation, inadequate modern technology, limited sensitization and awareness and limited literacy and competencies among repository managers.

5.2.8 Overall Applicability of SERVQUAL Model in Institutional Repositories

The purpose of the study was to assess the status of elements of SERVQUAL model in the in institutional repositories and then establish the composite applicability of the model. The findings of multiple linear regression show that reliability, responsiveness, tangibility, empathy and assurance comprised a statistically significant model for explaining the influence on digital institutional repository service provision at universities in Meru County. However, the results of regression weights indicated that although the four predictor variables were jointly statistically significant in a combined model, it is assurance which exerts more influence on institutional repository service provision as compared to reliability, tangibility, empathy and responsiveness respectively, at universities in Meru County.

5.3 Conclusions

The conclusions of the study are presented starting with reliability, responsiveness, tangibility, empathy, assurance and lastly digital institutional repository service provision.

5.3.1 Reliability of Digital Institutional Repository Service Provision

On the first objective, reliability was determined by dependable collection, visible repository page and accurate and up-to-date information resources. However, the repository link function-ability, internet bandwidth, physical section opening hours and ICT infrastructure and facilities were limited. Therefore, reliability aspect in digital institutional repositories at selected universities in Meru County was satisfactory. This infers repository managers, system and university librarians to intervene to check the function-ability of the repository webpage, revise the physical section opening hours and pushing for ICT infrastructure and facilities like stable internet bandwidth, wifi and students computers to enable learners to access and utilize the repository.

5.3.2 Responsiveness of Digital Institutional Repository Service Provision

Responsiveness in repositories was determined by: staff etiquette, courtesy, politeness, willingness, attentiveness, timeliness to customer needs and the repository bringing relevant feedback immediately after executing a search. However, feedback platforms, limited student competencies and few staffs hindered responsiveness. This led to the conclusion that, responsiveness in digital institutional repositories at universities in Meru County was satisfactory. This situation points to the university librarians and ICT Managers to improve responsiveness by developing feedback platforms, creating awareness and training students on how to access and utilize digital repository resources.

The findings also infer that university management need to hire more staff to ensure adequacy.

5.3.3 Tangibility of Digital Institutional Repository Service Provision

Concerning tangibility, the staff were neat, classified the repository materials, made sure materials were downloadable, implemented the repository policies and procedures, had installed DSpace software and arranged physical facilities. Nevertheless, there were low levels of tangibility expressed by unattractive appearance of physical resources, inadequate infrastructure, inadequate information resources, and limited physical facilities. Moreover, research projects for post-graduate diploma students were also lacking. The study established that the state of tangibility in digital repositories at selected universities was moderate. This state require concerted efforts of the university management body to allocate funds for developing and purchasing required infrastructure and resources.

5.3.4 Empathy of Digital Institutional Repository Service Provision

On empathy, University libraries at Meru County had established a great extent of empathy measures such as giving customers individual attention, were responsive, gave timely feedback, and adhered to library policies and practices. Regardless, users did not get notifications when new documents were published and the repository website failed to remind a student on previous searches. Conclusively, the state of empathy was satisfactory. This calls for ICT manager's involvement in adding retrieval and notification features in the DSpace software.

5.3.5 Assurance of Digital Institutional Repository Service Provision

The last objective was assurance. The study conclude that, some aspects of assurance such as integrity standards, timely feedback, intellectual property rights and creative common

162

licenses had been put in place. However, the repositories lacked information retrieval features such as spelling suggestions, aesthetic discoverable tools/features for up scaling digital repository service provision. Also, there was limited awareness, staff training and repository technology. This led to the conclusion that, assurance extent among institutional repositories at university libraries in Meru County was moderate. This necessitates the need to implement student awareness, staff retooling and ICT manager contribution to upgrade the DSpace software with aesthetic discoverable tools/features.

5.3.6 Digital Institutional Repository Service Provision

Effective digital institutional repository service provision was crucial in university libraries. It required concerted efforts of both repository managers, university management and the post-graduate students. The SERVQUAL model components (reliability, responsiveness, tangibility, empathy, assurance), were applicable and statistically explained the influence on digital institutional repository service provision at universities in Meru County. Other crucial aspects that influence service provision were: staff knowledge, customer care competencies, adequate infrastructure, facilities, ICT technology, customer awareness, funding and information resources, which were nevertheless, deficient. It was clear that some guidelines existed for ensuring effective service provision. Tangibility, assurance and empathy was hindered by limited infrastructure, limited funding to upgrade technology, irregular accessibility of the website and lack of modern information retrieval features such as spelling suggestions, aesthetic discoverable tools/features.

5.3.7 Overall Applicability of SERVQUAL Model in Institutional Repositories

The results of regression weights indicated that although the four predictor variables were jointly statistically significant in a combined model, it is assurance which exerts more influence on institutional repository service provision as compared to reliability, tangibility, empathy and responsiveness respectively, at universities in Meru County.

5.4 Recommendations

The study outlined recommendations based on the presented findings, adopted theory and the implications on policies and practices in university libraries. These are organized in accordance to the study objectives.

5.4.1 Reliability of Digital Institutional Repository Service Provision

Reliability improved service provision by ensuring dependability, regular customer visits and needs satisfaction. Thus, the study noted the need for repository managers and system librarians to be checking the function-ability of the repository webpage on a daily basis. This will not only increase reliability but also result into increased usability, accessibility and service provision. The study noted that, the repository opening hours and ICT infrastructure were limited hence it recommends that university librarians to revise the physical section opening hours and push for ICT infrastructure and facilities like stable internet bandwidth, wifi and students computers to enable learners to utilize the repository.

5.4.2 Responsiveness of Digital Institutional Repository Service Provision

As evidenced in the study, the level of responsiveness was weak as stakeholders indicated lack of feedback platforms for submitting queries, dismal post-graduate student's repository awareness and inadequate institutional repository managers. Therefore, this

points to the university librarians to support for the establishment of feedback platforms in the repositories such as WhastsApp a repository manager, chat a repository manager and user guides. Also, librarians should create awareness on the services offered in the repositories through trainings, one-on-one basis, and open access weeks apart from the semester scheduled orientations. The study further recommends university librarians to encourage, plan and push the university management to consider employing more repository staff.

5.4.3 Tangibility of Digital Institutional Repository Service Provision

Tangibility was moderate in digital institutional repositories at universities in Meru County. Henceforth, there is, need to strengthen tangibility though implementing policies and procedures addressing cataloguing and classification, information security and collection development of repository information resources. Nevertheless, there were unattractive physical resources, inadequate infrastructure and physical facilities. This implied the need to involve university management body to support and fund the acquisition of new and refurbishing of existing resources, technologies and infrastructure. Furthermore, the exclusion of post-graduate diploma student's research projects called upon the directorate of research to revise the post-graduate policy to include all post-graduate levels' research in order to achieve inclusive service provision.

5.4.4 Empathy of Digital Institutional Repository Service Provision

The importance of empathy in service provision in digital institutional repositories was noted. There is need for university librarians to develop policy to guide staff ethics, etiquette and code of conduct in university libraries. Policy will also strengthen attention,

care, keenness, interest responsiveness, timeliness feedback, integrity, openness and honesty when serving customers. Furthermore, the study indicated the need to for ICT managers to add features to help users get notifications when new documents are published and reminders for previous searches to the DSpace software. His will improve the empathy of the repository software. Thus, to achieve this, the university management body should provide financial intervention to upgrade repository technology to keep track with changes in user information needs.

5.4.5 Assurance of Digital Institutional Repository Service Provision

The importance assurance in digital institutional repository service provision was noted. The repository managers played critical role in assuring post-graduate students by being courteous knowledgeable, responsive, available and training students on how to access repository materials. These roles imply a need for well-versed, knowledgeable and competent staffs. University librarians should therefore, support internal capacities of repository staff through regular training and professional development. Lastly, ICT managers and University librarians should establish guidelines and financial policies that influence acquisition, upgrading, maintenance and management of repository technology and infrastructure at university libraries in Meru County.

5.4.6 Digital Institutional Repository Service Provision

The state of digital institutional repository service provision indicates the need to enforce good policies and practices in university libraries which will guide repository managers to assure, respond and offer reliable services. The issue of institutional repository staff lacking knowledge and competencies in handling customers and their needs also featured predominantly, pointing a need for retooling of staff. Therefore, the university librarians

should organize training, seminar and benchmarking sessions to ensure continuous professional development, re-sharpening of skills which in return will improve service provision. The study noted the adequacy of facilities, resources and infrastructure was limited and therefore, it recommends university management to intervene by funding and increasing budget allocation which will cater for upgrading technology, furniture, infrastructure and facilities.

5.4.7 Implications of the Findings on Theories, Practices and Policies

The study findings concluded reliability, responsiveness, tangibility, empathy and assurance aspects had positive and substantial influence on digital institutional repository service provision at selected universities in in Meru County. These findings support the argument drawn from SERVQUAL model which stated that, service quality among organizations was dimensionally being influenced by the nature of the goods, products or service' tangibility, reliability, responsiveness, empathy or assurance dimensions. The results from the literature reviewed in chapter two also aligned with the presented results that customer care and marketing aspects (reliability, responsiveness, tangibility, empathy, assurance) influence service provision among libraries.

The presented results also implicate on institutional repository policies, measures and practices to include important activities such as staff retooling, staff code of conduct, etiquette and students awareness. The results further implicates the university management body to upgrade funds allocation and budget to libraries adequate to cater for infrastructure, technology, facilities and resources.

Moreover, the study implicates the university librarians to facilitate and approve post-graduate student's awareness and training sessions to make them proficient in accessing,

downloading and utilizing repository information resources and also aware of the procedures on plagiarism and creative common license compliance. These proposed recommendations require revamping of the institutional repository policy by the repository staff to accommodate post-graduate diploma students and clearly defining their responsibilities in service provision.

5.5 Recommendations for further Studies

Considering the presented results which have underscored prevalence of deficiencies in SERVQUALmodel aspects and digital institutional repository service provision in universty libraries, the following recommendations for further studies are outlined:

i.   In carrying out this study, it was observed that SERVQUAL model (reliability, responsiveness, tangibility, empathy and assurance) aspects influenced institutional repository service provision to an extend of 66.6%. this implied that there are other factors which influence digital institutional repository service provision among university libraries. Therefore, a further study should be conducted to interrogate the probable factors such as post-graduate information seeking behavior, changing information needs and attitudes towards technology utilization on service provision in digital institutional repositories among university libraries.

ii.   The study assessed digital institutional repository service provision in university libraries and discovered that awareness, competencies, knowledge, skills, professionalism and training for institutional repository staff and post-graduate students impacted service provision. An extensive research can be conducted to interrogate the role of training and professional competencies in improving service

provision and recommend a comprehensive training module for librarians and students.

iii. The study adopted SERVQUAL model to investigate its applicability in information service provision at institutional repository sections. Further studies can be done to ascertain the same in other sections of the library such as user services and digital library sections.

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Appendix I: Consent to Participate in the Study

Tsenga Sophia Mjeni

Kenya Methodist University

P.O. Box 267 – 60200.

Dear respondent,

I am writing to request for consent to participate in my study which will help me to actualize my academic research that investigates on ***adopting SERVQUAL model in improving digital institutional repository information services to postgraduate students at universities in Meru County.*** This research hope to improve service delivery in digital institutional repositories by addressing the service quality and customer centred by repository managers.

Procedure to be followed

The specific questions in the questionnaire and interview is organized into sections ranging from section A to G. Section A covers the introduction part constituting the biographical information of the sampled respondents. Sections B, C, D, E and F, contain questions regarding the independent variables, while section G constitutes questions on the dependent variable. Most questions in the questionnaire are closed-ended, and a few open-ended ones for each construct. All sentiments in the questionnaire are in 5 points Likert scale. In total. It takes approximately 10 to 15 minutes to complete the questionnaire and 30 minutes to respond to interview questions. The respondent is under no obligation to complete the questionnaire or to answer all questions presented or participate in the interview. If one comes across a question which one don't wish to answer, simply skip it.

I hope you will be willing to participate in this study in your capacity as one of key respondent identified for the study.

Discomforts and risks

In this study, there is no risks of participating in the research. The reputation of the participant will also not be injured. The respondent is welcome to discontinue participation in the study at any time, should one wish to do so due to discomfort.

Benefits

If you participate in this study you will help us to improve service delivery in digital institutional repositories in Meru County by addressing the SERVQUAL model constructs. Your input is therefore critical in generating new knowledge and will go a long way in informing the measures that are needed to nurture customer care, customer-centred service provision with a view to improve service in digital institutional repositories.

Rewards

There is no reward for anyone who chooses to participate in the study. The participation is entirely voluntary. Each participants is asked to avail information freely as part of contribution to community development.

Confidentiality

Your participation in this study will remain strictly confidential. No name will be recorded on the questionnaire or attached to any of the data you provide. The data collection will be kept in a confidential location after collection and in future and, moreover, will not have anything to identify you.

Contact Information

Should you have questions regarding your participation, please contact me on sophia,mjeni@kemu.ac.ke. You may also contact my research supervisor at paul.maku@kemu.ac.ke

I am kindly asking you to sign the consent form (below) indicating agreement for you to participate in this study.

Participant's Statement

The above statement regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will not be victimized at my place of work/ studying institution whether I decide to leave the study or not and my decision will not affect the way I am treated.

Name of Participant………………………………… Date…………………………..

Signature……………………………………………….

Investigator's Statement

I, the undersigned, have explained to the volunteer in a language s/he understands the

procedures to be followed in the study and the risks and the benefits involved.

Name of interviewer…………………………………………Date…………………….

Interviewer Signature…………………………………………

Appendix II: Questionnaire for Post-graduate Students

Questionnaire for Post-graduate Students

Instructions

This questionnaire is designed to assess the adoption of SERVQUAL model in improving institutional repository information services to postgraduate students at universities in Meru County. Please do not write your name anywhere on this questionnaire. You are requested to read the questions and respond accordingly by ticking (√) and filling in the blank spaces appropriately. I further request that you answer all questions.

Section A: Demographic Information

1)   Indicate your gender
      a.   [1] Male

      b.   [2] Female

2) What is your level of academic status?
      a. Postgraduate Diploma   [1]

      b. Master's   Degree   [2]

      c. Doctorate (PhD) Degree   [3]

SECTION B: Reliability

3) To what extent do you agree or disagree with each sentiment provided below regarding reliability and institutional repository service provision in your university; *VSE = to a very small extent, SE = to a small extent, ME = to a moderate extent, LE = to large extent, VLE = to a very large extent*.

Statements on reliability	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)
a. The repository provides me with accurate information resources	[1]	[2]	[3]	[4]	[5]
b. I receive services in the repository exactly as they are promised during trainings, orientation and awareness period	[1]	[2]	[3]	[4]	[5]
c. The problems I raise concerning information services are always handled in an appropriate manner	[1]	[2]	[3]	[4]	[5]
d. I receive the services I request in the repository at and within the promised time	[1]	[2]	[3]	[4]	[5]
e. The repository link, page and website is always visible	[1]	[2]	[3]	[4]	[5]
f. The repository link, page and website is working	[1]	[2]	[3]	[4]	[5]
g. The collection housed in the repository are relevant to my search needs	[1]	[2]	[3]	[4]	[5]
h. The repository information resources are always updated	[1]	[2]	[3]	[4]	[5]
i. The physical section for the repository is always accessible	[1]	[2]	[3]	[4]	[5]

j.	The collection available in the repository are dependable for research and learning purposes	[1]	[2]	[3]	[4]	[5]

4) How would you rate the state of reliability of the institutional repository services at your institution?

      [1] Very Poor   [2] Poor   [3] Moderate   [4] Good   [5] Very Good

5) State what need to be done on reliability to increase service delivery in institutional repository of this university.

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SECTION C: Responsiveness

6) To what extent do you agree or disagree with each sentiment provided below regarding responsiveness and service delivery in institutional repository of this university.

; *VSE = to a very small extent, SE = to a small extent, ME = to a moderate extent, LE = to large extent, VLE = to a very large extent*.

Statements on responsiveness	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)
a. I enjoy prompt information service delivery I request from the institutional repository	[1]	[2]	[3]	[4]	[5]
b. The repository staff timely respond to my queries	[1]	[2]	[3]	[4]	[5]
c. The staff in charge of the repository service are always willing to help	[1]	[2]	[3]	[4]	[5]
d. The staff managing the institutional repository section are pay attention to my information needs requests	[1]	[2]	[3]	[4]	[5]
e. When I query the repository page, it always bring relevant answers to the search terms and key words	[1]	[2]	[3]	[4]	[5]
f. There is an email for sending any complaints and compliments to the librarians in the library repository	[1]	[2]	[3]	[4]	[5]
g. The staff in charge usually responds to user quarries in a very polite manner	[1]	[2]	[3]	[4]	[5]

h. The repository website return feedback results immediately after a executing a search	[1]	[2]	[3]	[4]	[5]

7) How would you rate the level of your awareness of the information services provided by the institutional repository at your university?

[1] Very Poor   [2] Poor   [3] Moderate   [4   ] Good   [5] Very Good

8) How would you rate the state of responsiveness of the institutional repository services at your institution?

[1] Very Poor   [2] Poor   [3] Moderate   [4   ] Good   [5] Very Good

9) State what need to be done on responsiveness to enhance service delivery in institutional repository of this university.

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SECTION D: Tangibility

10) To what extent do you agree or disagree with each sentiment provided below regarding tangibility and service delivery in institutional repository of this university.;
VSE = to a very small extent, SE = to a small extent, ME = to a moderate extent, LE = to large extent, VLE = to a very large extent

Statements on tangibility	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)
a. The repository section is equipped with modern useful equipment	[1]	[2]	[3]	[4]	[5]
b. The facilities available at the repository section are visually appealing	[1]	[2]	[3]	[4]	[5]
c. The repository staff are appealing and neat in appearance	[1]	[2]	[3]	[4]	[5]
d. There are adequate information resources for academic purposes in the repository	[1]	[2]	[3]	[4]	[5]
e. It is very easy to navigate the institutional repository web-site	[1]	[2]	[3]	[4]	[5]
f. The content in the repository is well organized	[1]	[2]	[3]	[4]	[5]
g. Documents in the repository are easily downloadable	[1]	[2]	[3]	[4]	[5]
h. Physical documents in the repository section are well organized	[1]	[2]	[3]	[4]	[5]
i. The physical facilities and reading areas in the repository are well arranged	[1]	[2]	[3]	[4]	[5]

j.	The repository section in the library has adequate facilities	[1]	[2]	[3]	[4]	[5]
k.	Technological infrastructure is essential in achieving tangibility of repository services	[1]	[2]	[3]	[4]	[5]
l.	I do feel that I have benefited from the services that I receive at repository section	[1]	[2]	[3]	[4]	[5]

11) How would you rate the state of tangibility of the institutional repository facilities and infrastructure at your institution?

[1] Very Poor   [2] Poor   [3] Moderate   [4] Good   [5] Very Good

12) State what need to be done on tangibility in order to enhance service delivery in institutional repository of this university.

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SECTION E: Empathy

13) To what extent do you agree or disagree with each sentiment provided below regarding empathy and service delivery in institutional repository of this university.;
VSE = to a very small extent, SE = to a small extent, ME = to a moderate extent, LE = to large extent, VLE = to a very large extent

Statements on empathy	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)
a. The staff in charge of the repository section gives me individual attention when I visit the site or the section	[1]	[2]	[3]	[4]	[5]
b. The repository opening and closing hours are convenient for me	[1]	[2]	[3]	[4]	[5]
c. The repository section has best interest for their customers at heart	[1]	[2]	[3]	[4]	[5]
d. My information needs are usually understood	[1]	[2]	[3]	[4]	[5]
e. My information needs are usually attended to well	[1]	[2]	[3]	[4]	[5]
f. I can assess the repository at any given time and place with my mobile phone or laptop	[1]	[2]	[3]	[4]	[5]
g. The procedure for accessing information resources in the repository is brief, uncomplicated and quick	[1]	[2]	[3]	[4]	[5]
h. The repository enable me to save my search results for future references	[1]	[2]	[3]	[4]	[5]
i. The websites has features such as reminding and suggesting me documents and resources based on my previous searches	[1]	[2]	[3]	[4]	[5]

j. I get notifications on new documents uploaded and published in the institutional repositories	[1]	[2]	[3]	[4]	[5]
k. The repository manager in this university is caring about my information needs					
l. The repository manager in this university is concerned about my information needs	[1]	[2]	[3]	[4]	[5]

14) How would you rate the state of empathy level of the institutional repository?

   [1] Very Poor   [2] Poor   [3] Moderate   [4] Good [5] Very Good

15) State what need to be done on empathy in order to enhance service delivery in institutional repository of this university.

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SECTION F: Assurance

16) To what extent do you agree or disagree with each sentiment provided below regarding assurance and service delivery in institutional repository of this university.;

VSE = to a very small extent, SE = to a small extent, ME = to a moderate extent, LE = to large extent, VLE = to a very large extent

Statement on assurance	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)
a. The employee in the repository section is courteous with customers	[1]	[2]	[3]	[4]	[5]
b. The employee in charge of institutional repository is very rich in knowledge	[1]	[2]	[3]	[4]	[5]
c. The institutional repository has adequate security features	[1]	[2]	[3]	[4]	[5]
d. In the institutional repository, (plagiarism) academic integrity is complied with	[1]	[2]	[3]	[4]	[5]
e. In the institutional repository, creative common licenses are complied with	[1]	[2]	[3]	[4]	[5]
f. The repository web-site has spelling suggestion to assure the retrieval of accurate information	[1]	[2]	[3]	[4]	[5]
g. The repository managers is versed with wide range of knowledge, skills and competencies	[1]	[2]	[3]	[4]	[5]
h. I have a lot of confidence in the information services rendered in the institutional repository	[1]	[2]	[3]	[4]	[5]
i. The repository website is user friendly	[1]	[2]	[3]	[4]	[5]

j. The information I retrieve from the repository satisfies my information needs	[1]	[2]	[3]	[4]	[5]

17) How would you rate the state of assurance level of the institutional repository services?

   [1] Very Poor   [2] Poor   [3] Moderate   [4] Good   [5] Very Good

18) State what need to be done on assurance aspects in order to enhance service delivery in institutional repository of this university.

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SECTION G: Institutional Repository Service Provision

19) To what extent do you agree or disagree with each sentiment provided below regarding service delivery in institutional repository of this university.; *VSE = to a very small extent, SE = to a small extent, ME = to a moderate extent, LE = to large extent, VLE = to a very large extent*

Statement on service delivery in institutional repositories	VSE(1)	SE(2)	ME(3)	LE(4)	VLE(5)
a. Reliability aspects of the institutional repository services increase user satisfaction in our institution	[1]	[2]	[3]	[4]	[5]
b. Responsiveness of institutional repository service increase satisfaction in our institution	[1]	[2]	[3]	[4]	[5]
c. Tangibility of institutional repository services increase user satisfaction in our institution	[1]	[2]	[3]	[4]	[5]
d. Empathy of institutional repository service increase user satisfaction in our institution	[1]	[2]	[3]	[4]	[5]
e. Assurance of institutional repository service increase user satisfaction in our institution	[1]	[2]	[3]	[4]	[5]
f. There are adequate infrastructures, facilities and reading areas in of institutional repository service in our institution	[1]	[2]	[3]	[4]	[5]
g. The institutional repository staff are polite, courteous and respectful	[1]	[2]	[3]	[4]	[5]
h. The institutional repository services are accessible at all times	[1]	[2]	[3]	[4]	[5]

i.	Institutional repository services are essential in enhancing satisfaction of information user needs	[1]	[2]	[3]	[4]	[5]
j.	There is no sluggishness in service delivery at institutional repository services in out institution	[1]	[2]	[3]	[4]	[5]

20) Provide suggestions here on what should be done to improve institutional repository service provision at your university.

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Thank you for your cooperation and time.

Appendix III: Interview Schedule for Library Heads of Sections

SECTION A: Demographic Information

1) How many years have you served as a head of section?

SECTION B: Reliability

2) Describe the measures that you have taken to ensure reliability of institutional repository service provision at your university.

3) Explain the ways in which reliability of resources, services and repository system affect institutional repository service provision at your university.

SECTION C: Responsiveness

4) Describe the measures that you have taken to ensure responsiveness is achieved in the institutional repository section

5) Please, explain how responsiveness affect institutional repository service provision in university libraries.

SECTION D: Tangibility

6) Describe the measures that you have taken to ensure institutional repositories are tangible.

7) Explain the ways in which tangibility foster institutional repository service provision in university libraries.

SECTION E: Empathy

8) Describe the measures that you have put in place to ensure empathy when providing institutional repository services at your institution.

9) Explain ways in which empathy contribute to improving institutional repository service provision in university libraries.

SECTION F: Assurance

10) Describe the measures that you have put in place to assure the library patrons of institutional repository services at your institution.

11) Explain ways in which assurance contribute to improvement in institutional repository service provision in university libraries.

SECTION G: Service Provision in Institutional Repositories

12) What are the main drawbacks to achieving effective and quality service provision in institutional repositories?

13) State what you feel should be done to improve the quality of service provision in institutional repositories in Meru County?

Thank you for your cooperation and time.

Appendix III: Introduction Letter to NACOSTI

KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya   Fax: 254-64-30162
Tel: 254-064-30301/31229/30367/31171   Email: deanrd@kemu.ac.ke

DIRECTORATE OF POSTGRADUATE STUDIES

February 27, 2023

Commission Secretary,
National Commission for Science, Technology and Innovations,
P.O. Box 30623-00100
NAIROBI.

Dear Sir/Madam,

RE: TSENGA SOPHIA MJENI – (REG. NO. ISK-3-0474-3/2021)

This is to confirm that the above named person is a bona fide student of Kenya Methodist University, in the School of Science and Technology, Department of Information Science undertaking a Master's Degree in Information Science. She is conducting research on: "**Adopting Servqual Model in Improving Digital Institutional Repository Information Services to Postgraduate Students at Universities in Meru County**".

We confirm that her research proposal has been presented and approved by the University.

In this regard, we are requesting your office to issue a research license to enable her collect data.

Any assistance accorded to her will be appreciated.

Thank you.

Dr. John M. Muchiri (PhD)
Director, Postgraduate Studies

Cc: Dean SST
      CoD, IS
      Program Coordinator - IS
      Student Supervisors

Appendix IV: NACOSTI RESEARCH PERMIT

REPUBLIC OF KENYA

**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: 430462

Date of Issue: **20/March/2023**

RESEARCH LICENSE

This is to Certify that Ms.. Tsenga Sophia Mjeni of Kenya Methodist University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Meru on the topic: ADOPTING SERVQUAL MODEL IN IMPROVING DIGITAL INSTITUTIONAL REPOSITORY INFORMATION SERVICES TO POSTGRADUATE STUDENTS AT UNIVERSITIES IN MERU COUNTY for the period ending : 20/March/2024.

License No: **NACOSTI/P/23/24296**

430462

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY &
INNOVATION

Verification QR Code

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