ACCESS AND UTILIZATION OF INFORMATION IN DIGITAL RESOURCE PLATFORMS FOR TEACHING AND RESEARCH BY ACADEMIC STAFF IN SELECTED PUBLIC UNIVERSITIES, KENYA

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A RESEARCH THESIS SUBMITTED TO THE BOARD OF POSTGRADUATE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE CONFERMENT OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN INFORMATION SCIENCE, OF SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY, DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE, KISII UNIVERSITY

2024

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DEDICATION

This thesis is dedicated to my sons: Austin Avudi and Titus Aradi. Granddaughters: Zoey Anne Aradi and Favour Rodah Avudi who are my inspiration.

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Above ALL, this far, it is God.

ABSTRACT

Universities now acknowledge the value of digital resource platforms as a useful tool for research, instruction, and learning. As technology for communication and information (ICTs) advance, they make it possible for information to be widely accessed, shared, and distributed. But due to the complexity of these platforms and the mismatch among consumer demands and information platforms, users of digital resource platforms in universities find it difficult to navigate and access information efficiently. If this is not addressed, it may negatively impact teaching and research production, which are essential responsibilities of universities. The primary aim of the research was to develop a framework for advancing and improving information access and use in digital resource platforms inside Kenyan university libraries. The aims of this thesis were to investigate the issues that academic staff face when trying to access and use the information on digital resource platforms, analyze the various kinds of digital resource platforms, assess the visual design of digital resources platforms, gauge the level of digital literacy among academic staff, and suggest a framework for doing so. The Theory of Information Interchange and the Unified Theory of Acceptance and Use of Technology served as the study's foundation. Using a mixed method approach, the study was grounded in a pragmatic paradigm. This made it possible for the research to gather both quantitative and qualitative data, which aided in the collection of precise and trustworthy data. Techniques for census and purposeful sampling were employed to select responders from the intended population. There were 113 responders in the sample, including 23 library employees in charge of digital content, four university librarians, and 86 members of the academic staff. Version 25 of the Statistical Packages for Social Sciences was utilized to examine the quantitative data, while theme analysis was employed to assess the qualitative data. Descriptive statistics were used to assess the data, which were then shown as tables, charts, and verbatim reports. The discussions from the study were important because they might be used to the adoption of a framework for information use in university digital resource platforms. The results demonstrated that university libraries offer a variety of digital resource platforms, such as websites, institutional repositories, and OPACs. While textual, audio-visual, and video information was available, electronic journals, e-books, and theses were the most popular forms of digital content. Users found the digital resource platforms' visual designs unappealing; the overflowing content, poor use of color and images, complex search functions, insufficient filters to help users find pertinent information, and a lack of links to sources outside the collection to be unappealing. Inadequate digital literacy abilities and a delayed adoption of technology by academic personnel led to inefficient access to and underutilization of e-content. Lackluster visual design, insufficient digital literacy, a narrow selection of digital resources platforms, and technological dynamism were the main issues facing academic personnel. In order to provide more access, the study suggested expanding digital resource platforms, creating visually appealing designs, and providing users with ongoing instruction in digital literacy. In university libraries, the study suggested a framework for encouraging the use and accessibility of digital resource platforms.

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LIST OF ABBREVIATION AND ACRONYMS

CMU: Carnegie Mellon University

CUE: Commission for University Education

DLI: Digital Library of India

IBM: International Business Machine

ICTs: Information Communication Technologies

IIITH: International Institute of Information Technology, Hyderabad

IIRF: Integrated Information Retrieval Framework

IIS: Indian Institute of Science

ISB: Information Seeking Behavior

JKUAT: Jomo Kenyatta University of Agriculture and Technology

LIS: Library and Information Science

ODL: Oxford Digital Library

OER: Open Educational Resources

OJS: Open Journal System

OPAC: Online Public Catalogue

RAP: Repository Access Protocol

UTAUT: Unified Technology Acceptance and Use Technology

CHAPTER ONE

INTRODUCTION

The study's background, issue statement, importance, aims, and study questions are all presented in the first chapter. It also includes the study's presumptions, constraints, scope, conceptual framework, and definitions of key terminology.

1.1 Background to the Study

The growth of ICTs, or information and communication technologies, has led to a tremendous rise in the availability, ease of access, and usage of electronic information. This has significantly changed how users obtain and use information as well as how libraries at universities provide services for information. According to Jabeen et al., (2017) the concept of digital content is traced back to 1945 when digital libraries were proposed by Bush. It was until early 1990s that the Americans embraced the initiative of these libraries. According to Chowdhury and Chowdhury (2016), in 1995 library science, computer science, and other allied fields experienced a rapid reorientation toward the supply of information in digital form. This was after the launch of the Global Digital Library plan by the International Business Machine (IBM).

Digital material channels, which are widely acknowledged as important tools for university teaching, learning, research, and innovation, are where digital material is accessible (Vran, 2015; Veena, 2016). For this reason, university libraries are adjusting to new provisions of responding to the academic community’s needs in research and education through the establishment of digital resource platforms. This will enable users to access information in real-time and without limitations that were experienced with traditional libraries.

Worldwide, the information landscape has undergone an evolution as a result of the quick advancement of computers and the widespread use of the Internet. In research on the usability of digital libraries at five top state institutions in China, Jabeen et al. (2017) found that the availability of the Internet had changed how information is collected, organized, disseminated, accessed, and used. The Online Public Access catalogue (OPAC) was the main source through which users obtained and used information, according to the authors. They also listed obstacles to information access and use in Chinese university libraries, such as the absence of appropriate software, lack of funding, users' difficulty in navigating databases, and copyright protection. The study further pointed out that lack of instructional programs and training sessions and inadequate databases impeded the efficient use of digital material channels for knowledge acquisition and consumption among users.

Veera (2016) acknowledges that digital resource channels are a tool accessible to the public that facilitate the exchange of information and culture in India. Nevertheless, the study observes that most of the Indian universities and higher learning institution libraries were automated but not digitized and only few universities had established digital libraries. The authors also note that the university libraries experience user interface design challenges that are user oriented, search oriented, content oriented and network oriented. In Malaysia, Rahman and Mohezar (2020) conducted a study on ensuring continued use of a digital library. The authors acknowledged that digital resource platforms were established for purposes of facilitating academic staff in universities to aid students in the process of learning by sharing and imparting fundamental or practical information.

However, the study established that users experienced a myriad of challenges in accessing and utilizing information including lack of understanding of the functions of the web

OPAC, knowledge taxonomy and e-resources. This resulted to users spending more time navigating through the pages to find the needed information. Further, the study noted that users expressed frustrations with the use of passwords and usernames which were seen as time-wasting. The study established that users sought alternative sources including Google Scholar to meet their information needs. The study findings showed that users felt that digital resource platforms were not user-friendly and that there were no trainings to empower users to effectively access and utilize information.

Equally, on the regional scene, Kautonen and Nieminen (2018) affirm that digital resource platforms are symbols of the contemporary era and essential tools for teaching, learning and research. This may be explained by the way that information in digital format is distributed among users, allowing for widespread access, sharing, and distribution. Omah and Urhiewhu (2019) assert that access to and use of information on digital resource channels by students and faculty members in Nigeria is essential for obtaining sufficient and high-quality educational and instructional materials. The authors note that geographical obstacles to information access are broken by digital content. However, it is unclear how digital resource contexts affect users' information-seeking habits. Content specialists must reevaluate how people are presented with digital content and make it more usable and accessible.

University libraries, by giving its users access to pertinent information services, are consequently essential to assisting teaching, learning, and research. Okello-Obura and Magara (2008) investigated Makerere students' use of and access to computers in Uganda. The study findings showed that users mostly accessed information through the OPAC but pointed out that users faced various challenges including lack of Information Technology

(IT) knowledge to effectively use the services. The users also experienced too much information and uncooperative library staff to help them easily access information.

On the local scene, universities have not established digital libraries but offer e-resources or digital content information services that are hosted on university websites. The Government of Kenya has made efforts to support the implementation of ICT-related changes in various government departments including libraries. However, the pace has remained low and wanting to meet the required standards. Micheni and Murumba, (2014) observe that most digital resource content is still in the implementation stages. This may be the reason for the slow pace experienced in digitization of libraries in Kenya. These calls for action by the university management and librarians to take intervention measures in library information service provision so as to keep pace with the digital era. This is because access and utilization of digital information services is essential for academic staff to deliver on their teaching role and also achieve research objective.

Most university libraries in Kenya offer blended information services through the library's physical building and online (Nakitare et al., 2018). However, the libraries continue to experience a drastic decline in the uptake of traditional information services including browsing through library shelves to borrow physical books. Rutto (2011); Ndakalu (2014); Kamau (2015); Omette (2016) observe that information services were underutilized because users lacked technical skills to access e-resources, poor internet connectivity and infrastructure, low awareness of the available information sources. Okemwa (2016) observe that while digital resource platforms exist to support teaching, learning, and research, users still experience challenges that hinder effective access and utilization. According to Weng'ua, Rotich & Kogos (2017), improper access and usage of information

on digital resource channels impacts the quality of instruction and academic output which are essential responsibilities of universities. The quality of education in society is highly associated with digitization of the information. The users' abilities to access and utilize information in digital platforms therefore need to be addressed otherwise Kenya will experience continuous deterioration of research output and produce poorly trained graduates.

Studies on global, regional and local scenes acknowledge that digital resource platforms are indispensable instruments for quality teaching, learning and research. The platforms facilitate academic staff with easy, fast, and timely access to information that is required to complete their academic activities. However, the studies indicate that information in these platforms is ineffectively accessed and utilized citing a myriad of challenges. According to Wang, (2016) the complexities that come along with the rapid developments in ICTs require that users are placed at the center when developing information systems. The intricacies of information environments are affected by new technologies and the process of accessing information in digital resource platforms. This is because digital resource platforms are fairly new entities in developing countries that have underdeveloped ICT infrastructure hence the need for users' viewpoints to be the focus when developing digital resource platforms (Kumar, 2016; Jones et al., 2020). This may help deal with issues of user requirements to facilitate access and utilization of digital information. Daramola (2016) observes that users' views are usually ignored when developing digital resource platforms and this result to a miss-match between the users' expectations of the information systems which negatively affects access and utilization of information.

Besides, Adam (2017) and Al-Saleh (2016) observe that challenges that come with content organization in digital resource platforms and the complexity of finding information demean the purpose of digital resource platforms. The platforms are supposed to break the geographical boundaries, distance and facilitate easy, fast and real-time access to information. The content on library websites needs to be systematically arranged to attract users and library staff to provide simple guidelines for access. According to Thilagarathi and Thirunavukkarasu (2015), ICTs have a significant impact on individual's ability to access and use information, which improves the process of learning and sharing knowledge. ICTs, whose methods have changed the information environment in which people obtain information are a necessary component of digital resource platforms (Chowdhury, 2016). It is essential for information professionals to be knowledgeable on how to make digital resource platforms responsive and easier to navigate to facilitate appropriate interaction from the information seekers to meet their needs.

A research by Makokha and Mutisya (2016) was carried out at public institutions, including Jomo Kenyatta University, Kenyatta University, Moi University, Egerton University, and University of Nairobi. The study's objective was to evaluate the state of electronic learning at Kenya's public institutions. The results demonstrated that Kenyan universities lacked the necessary ICT resources and expertise. The authors further noted that the platforms on which learning modules were uploaded were not interactive. When a digital resource platform is not interactive then the purpose for which it was developed is negated and affects effective teaching and learning.

Additionally, Adala (2016) conducted a study on the current state of advancement of Open Access Resources in Kenya. The study sites included the University of Nairobi, Egerton University and Kenyatta University. The study found out that universities had low level of knowledge skills, faced funding challenges to fully implement digital platforms. The author further observed technological challenges attributed to low level of comfort with technology and poor basic ICT skills. Consequently, a research by Makokha and Mutisya (2016) was carried out at public institutions, including Jomo Kenyatta University, Kenyatta University, Moi University, Egerton University, and University of Nairobi. The study's objective was to evaluate the state of electronic learning at Kenya's public institutions. The results demonstrated that Kenyan universities lacked the necessary ICT resources and expertise.

The necessity for a framework is thus effective in moderating the challenges of accessing and utilizing information in digital resource platforms by the academic staff by enhancing their comprehension of information sources. Such a framework is envisioned to be of importance in two folds. Firstly, it would help develop new enhanced systems for information dissemination and addressing the needs observed in institutions of higher learning. Secondly, it would enable integration of new and traditional knowledge systems for ease of use.

However, for the framework to guide effectively, some constraints (enablers) including the visual design and relevant ICT skills need to be addressed. Omah and Urhiewhu (2019) observe that frameworks provide organizations with the certainty of developing an application that is compliant with the institutions' practices and requirements. The

University of Nairobi, Kenyatta University, Moi University, and Egerton University were the four public universities in Kenya that served as the study's home institutions. Because the universities have extensive experience providing online learning, which depends on the digital resource platforms, they were able to give trustworthy information on information access and utilization (CUE, 2019).

1.2 Statement of the Problem

Users now have more options to access and use a variety of information resources thanks to the digital era. Because they are not limited, online resource platforms are an invaluable tool for research, teaching, learning, and innovation in higher education. The platforms are designed to make it simple, quick, and efficient to obtain information in suitable forms and sufficient quantities. However, according to Xie, Babu, Lee, Castillo and Hanlon (2020); Adala (2016); Niqresh (2019); Sejane (2017); Apuke and Iyendo (2018); Mabweazara, (2018) Users of digital resource channels inside their institutions are unable to efficiently use and access information, according to Ndakalu (2014) and Okemwa (2016). The complexity of the digital systems of information that house digital material is to blame for this. Because systems of information as well as customer expectations are not aligned, users of the institutions' digital resource systems have trouble navigating.

Despite the Government of Kenya making efforts to support ICT-related changes through initiatives of digitization of records, the implementation has remained slow in libraries. The complexities recounted to use digital resource platforms for information access and consumption including technological dynamism and digital literacy need to be addressed when developing systems that provide digital information. As well, digital resource

platforms within most universities in Kenya are in the development stage and with undeveloped ICT infrastructures. University libraries are struggling with the acquisition of appropriate facilities and capacity building to support digital information service provision. Additionally, when creating digital resource platforms for university libraries, user emphasis is essential. Although many colleges have not taken this into consideration, Kumar (2016) and Jones et al., (2020) note that integrating users at this stage will allow successful access and consumption. Inadequate use of electronic materials in libraries results in a scarcity of information resources, which is a major cause of poor research, teaching, and learning outcomes.

1.3 Purpose of the Study

The aim of this study was to develop a method that would facilitate and improve information access and use in online resource platforms found in Kenyan university libraries.

1.3.1 Specific Objectives of the Study

The study was guided by the following objectives:

i. To Examine the kinds of digital resources platforms that the chosen Kenyan public universities have available for research and instruction.
ii. To Analyze the digital resources platforms of the chosen Kenyan public universities' visual designs.

iii. To Examine the level of digital literacy among faculty members at the chosen Kenyan public universities.

iv. To Examine the difficulties that academic staff members encounter while trying to access and use information on digital resource platforms at the chosen public institutions in Kenya.

v. To provide a framework that academic staff at a few Kenyan public universities can use to access and use material on digital resource platforms.

1.4 Research Questions of the Study

i. What kinds of digital resources platforms are offered by Kenya's chosen public universities?

ii. What Is the digital resources platform design in Kenya's chosen public universities visually appealing?

iii. How Are the faculty members at the chosen public colleges in Kenya sufficiently proficient in digital literacy?

iv. What difficulties do academic employees in Kenya's chosen public institutions have finding and using information on digital resource platforms?

v. What framework that can be used to the online resource platforms in Kenya's chosen public universities to enable access to and usage of information?

1.5 Significance of the Study

The study's findings are anticipated to be important for decision-makers, including Kenya's Ministry of Education, which may find the recommendations on information access and utilization in electronic platforms useful for carrying out their duties in connection to meeting university research goals. The study's conclusions can also be useful to the Council

for University Education (CUE) in developing pertinent regulations that could improve the use of digital resources in Kenyan universities.

The study is also expected to be of importance to information professionals who may gain knowledge that inform the development of digital resource platforms that are user- friendly, attractive and develop collections and services that correspond to user needs. The results of this study may also help users understand how to apply the suggested framework to optimize their usage of the material available on digital resource platforms in different libraries. Furthermore, the results can serve as a foundation for further research, especially in the area of information access and use in university-based digital resource platforms. The study adds to our understanding of the frameworks that support information access and use in digital environments.

1.6 Assumptions of the Study

The study was based on the assumptions that:

i. Academic staff uses the available digital resource platform services in their universities.
ii. Universities have established digital resource platforms for information utilization.

1.7 Scope of the Study

According to Creswell (2019), a study's scope establishes the parameters that will govern its operation and indicates the degree to which the subject of the study will be investigated. The goal of this thesis was to offer a framework for bettering information access and use on digital resource platforms in Kenyan university libraries. Thematically, discussions were made on the types of digital resource platforms; the visual design that is: the indicators

of an attractive visual design in digital resource platforms, and the adequacy of digital literacy skills required for effective access and utilization of digital content. The study also investigated challenges experienced in utilization of information in digital resource platforms and proposed a framework for improvement.

Geographically, the research was limited to the University of Nairobi (UoN), Kenyatta University (KU), Moi University (MU), and Egerton University (EU), which are the four public universities in Kenya that were selected at random. The study exclusively looked at public universities, despite the fact that several private colleges also offer majors in library and information science. The idea behind this was that participants, who came from the four universities that were chosen, were knowledgeable trainers in the field of information and knowledge management and experienced users of digital resource platforms. They also understood the nuances of the subject matter and would supply accurate data. Methodologically, mixed method was leveraged to collect data from selected respondents in respect to investigating the aforementioned objectives of the study. Data from multiple sources was triangulated, unfolding patterns were merged to build explanations in the analysis.

1.8 Limitations of the Study

Four public universities were the focus of this study: Egerton University, Moi University, Kenyatta University, and University of Nairobi. Other venerable and well-established private universities in Kenya also have LIS programs.

Some respondents were away either on study leave or normal leave and could not be found physically to respond to the questionnaire.

1.9 Conceptual Framework

A conceptual framework is a roadmap the researcher plans to follow with the intention of looking for answers to the problems raised by the research questions (Creswell & Creswell, 2018). Figure 1.1 is an illustration of the conceptual framework for the study.

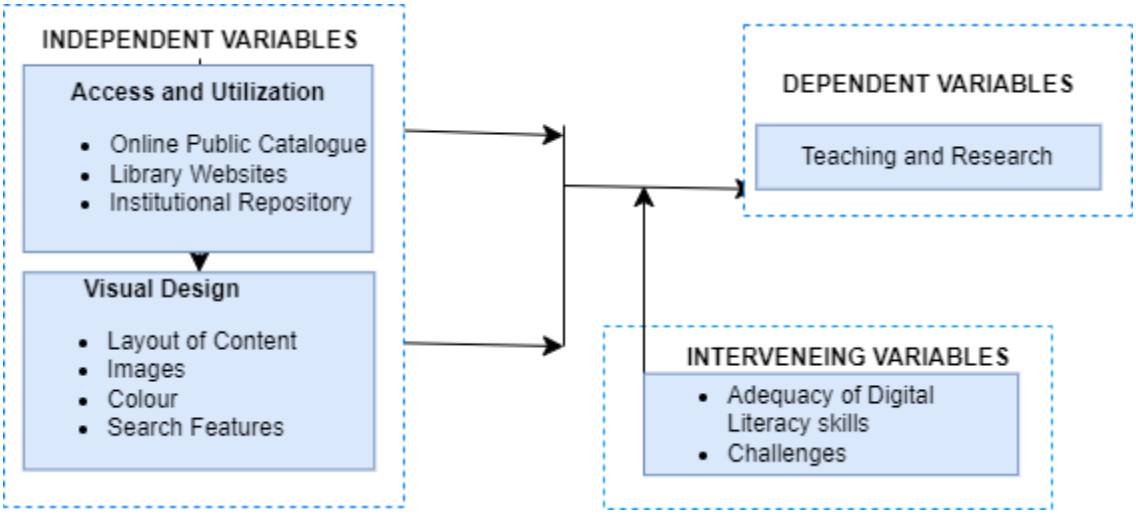


Figure 1.1 Conceptual Framework

The two independent variables in digital asset platforms are information access and use. Teaching and research are dependent on access to and utilization of information. Academic staff can effectively teach and conduct research if they successfully access and utilize information. However, academic staff may experience challenges that may hinder effective Information availability and use on digital resource platforms which are referred to as intervening variables.

1.10 Operational Definition of Terms

Academic staff refers to people who work for universities as instructors, mentors for students' academic research, researchers themselves, and publishers. may also indicate faculty member or lecturer, or they may be used interchangeably.

Access refers to the ability to identify and retrieve information from a digital platform effectively

Accessibility pertains to accessibility, simplicity of use, visibility, and closeness to information sources.

Attitude in this study refers to users view of digital resource platform as an enabler to easy and faster access to vast information content for teaching and research work.

Context in this study it refers to the circumstances in which a particular event or situation occurs.

Digital information refers to information that has been converted into a digital format and uploaded to an electronic information source. It can come from any source and be in any format. It alludes to the electronic resources that library patrons can access in this study.

Digital Library is a unique library that has a specialized collection of digital objects with tools for organizing, storing, and so on. These objects can be text, visual, audio, or video content that has been stored as electronic media forms (as compared to print, microform, or other media).

Digital resources refer to the information resources such as words, images, sounds and animations stored in the form of electronic data.

Digital resource platforms in this research, it refers to the modern digital content on the space that is hosted on the University's website.

Digital literacy refers to a person's capacity to locate, assess, and produce understandable content via writing as well as other media on a range of digital platforms.

Electronic Resources are documents made up of information or computer programs that have been encoded so that the computer may read and manipulate them with the help of a peripheral device that has a direct link to the computer or the internet. Software programs, electronic documents, and bibliographic databases fall under this category.

Information in this study it refers to facts, conclusions, ideas, and creative works of the human intellect and imagination which teaching staff in universities collect and use to complete the academic activities they involve in.

Learning refers to the process through which individuals gain knowledge from reading and studying.

Librarian in the study refers to individuals employed by the University in the library to provide and manage information services.

Navigation is the process of finding the way or following a map through space to find information.

Online Database is an organized collection of bibliographic information across different subject areas, stored preserved in an electronic form.

Public Universities are institutions of higher learning which are administered and funded by the government.

Research is a process employed by academic staff to facilitate the discovery of new knowledge in university.

Retrieval is a process of accessing and obtaining information from an information system

Utilization describes how well a system or product is used by users to accomplish the goal in which it was designed. It refers to the simplicity with which e-content can be eventually retrieved and used using ICTs in this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter covers the theoretical frameworks that served as the study's direction as well as discussions of digital resource platforms, their visual design, academic staff members' proficiency with digital literacy, and difficulties finding and using information on these platforms. A discussion of the most recent methods for improving information availability on digital resource platforms is also included.

2.2 Theoretical Framework

According to Olkla and Roux (2011), a theoretical framework is the outline and theoretical construct of a research approach that acts as a lens through which a researcher studies a specific aspect of their field of study. A theoretical framework is also defined as a significant logical structure that guides a study's direction by highlighting the main ideas and how they relate to one another (Creswell, 2013). The Unified Technology Acceptance and Use Technology (UTAUT) and Theory of Information Interchange (TII) served as the study's foundation.

2.2.1 Unified Theory of Acceptance and Use of Technology

Davis, Morris, Venkatesh, and Davis created the UTAUT model in 2003. The model clarified users' intents to use an information system as well as their actual usage patterns. Per Venkatesh, Thong, and Xu (2016), the theory posits that usage intention and behavior are directly determined by four main constructs: performance expectancy, effort expectancy, social influence, and facilitating factors.

Four main constructs are proposed to have an impact on usage intention and behavior; these are gender, age, experience, and voluntariness of use. Nonetheless, performance expectancy, effort expectancy, social influence, and facilitating conditions—the four main determinants that directly influence usage intention and behavior—were the only factors examined for the purposes of this study. One example of the UTAUT model is shown in Figure 2.1.

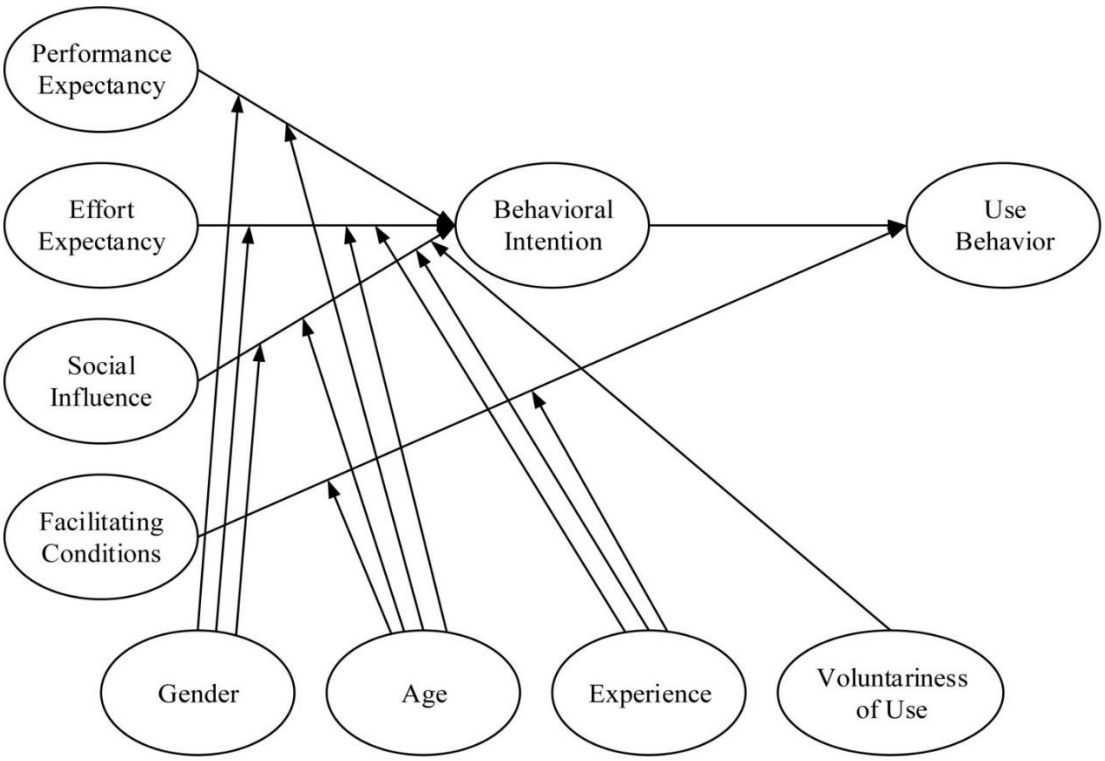


Figure 2.1 Unified Theory of Acceptance and Use of Technology model

Source: Venkatesh et al., (2003)

As per Venkatesh et al. (2003), the model defines performance expectancy as the degree of assurance a person has that they may enhance their job performance by gaining access to and employing new technology.

The fundamental performance expectancy constructs include perceived value, extrinsic motivation, task fit, relative advantage, along with result expectancies (Teo & Noyes, 2014). Extrinsic motivation is the theory that people will want to act in a certain way because they think it will help them reach goals unrelated to the behavior itself, including better job performance, higher income, or promotions (Wang & Shih, 2009). Performance outcomes are solely concerned with outcomes relating to the workplace, while personal results deal with self-worth and a sense of accomplishment. The performance expectancy construct in this study focused on how much academic staff members believe that having real-time access to and using information from digital resource platforms will help them perform better in their teaching and research (publication output).

Effort expectation, as defined by Venkatesh et al. (2003), is the degree to which new technologies are easy to use. The study's main focus was on the digital resource platforms' usability. Its primary pillars are perceived ease of use, complexity, and ease of use, according to Venkatesh, Thong, and Xu (2012). The degree to which academic staff members feel that using digital resource platforms to obtain the required information saves them time and effort is referred to in this study as perceived ease of use. But social influence is the degree to which an individual believes others should adopt the new technique (Venkatesh et al., 2003). The concept of social impact in this study refers to the degree to which academic staff members believe their professional or social colleagues should use digital resource platforms to obtain and utilize information for teaching and research.

According to Venkatesh et al. (2003), one measure of facilitating conditions is an individual's belief that the system's technical infrastructure and organization are there to enable its use.

Therefore, the extent to which a member of the academic staff feels that the infrastructure at their university will make it easier for them to access and use material on digital resource platforms.

Research on the use and accessibility of electronic resources has made use of the UTAUT paradigm. Ani (2013) concentrated on using the UTAUT model to examine how some Nigerian institutions used electronic resources for research in terms of accessibility and utilization. The study's conclusions demonstrated how the researchers' behavioral intention to use the information system was influenced by their performance expectations. Additionally, Omette (2016) effectively used the UTAUT paradigm to investigate how University of Eldoret academic staff members are aware of and use electronic information resources. Other theories of technology acceptance and usage are deemed less desirable than the UTAUT model due to its comprehensiveness and power (Sijane, 2017).

Although the UTAUT paradigm has been effectively used in numerous studies, there have been some criticisms. Raaij and Schepers (2008) believe that because UTAUT only achieves good regression at the point of moderating key interactions with up to four factors, it is less inexpensive than the prior Technology Acceptance Model and TAM2. Since different divergent items were combined to reflect a single psychometric construct, the authors further believe that the model presents issues when it comes to grouping and naming items and constructs. UTAUT, however, offers factors to take into account for

information access and use in digital resource platforms, which is why this research has adopted it. The Theory of Information Interchange was utilized to explain how information is used on digital resource platforms, complementing the UTAUT model and enhancing the research.

The global and integrative approach of the UTAUT model, which integrates a wide range of explanatory variables from the primary theoretical models designed to explain technology acceptance and use, supports the study's decision to employ it. After conducting a thorough literature review, Venkateshet al. (2003) developed a cohesive model that incorporates the shared contributions of the earlier ideas. Therefore, it makes sense to anticipate that a theory that incorporates the most significant contributions from other models will outperform earlier theories in explaining why people embrace and employ technology (Sijane 2017). Only the four primary tenets—performance expectancy, effort expectancy, social influence, and facilitating conditions—that directly influence usage intention and behavior were examined for the purposes of this study.

2.3 Theory of Information Interchange

Marcella and Bartex created the TII in 1997 (Dangani & Katsayal, 2015). The theory centers on the significance of taking into account the objectives and roles of both the information supplier and the information user when evaluating the efficiency of the information communications process and possible enhancements to it. The five constructs in the theory are holding, using, accessing, providing, and withholding. In this study providing referred to information being provided through digital resource platforms while holding means information is held in digital platforms. Withholding means access to

information is restricted and users can only access information that has been subscribed to by the library. Accessing refers to university libraries providing and enabling users to retrieve and make use of information in digital resource platforms. Use means academic staff utilizes the information to complete their tasks that is, teaching and research.

A number of studies, both inside and outside the information science community, have effectively applied the information interchange theory to their investigations of subjects' information-seeking behavior.

The information demands of public library customers in three Scottish authorities were examined by Marcella and Baxter (1997), who based their study on the TII. Furthermore, the TII was utilized by Marcella, Baxter, and Moore (2000) to investigate the efficacy of parliamentary information services in the UK. Based on the theory, the study investigated the efficacy of parliamentary communication and information strategies, paying particular attention to the caliber of public information services offered by the UK parliament. Moreover, Nalumaga (2012) investigated how Ugandan parliamentarians accessed and used information using the TII. The study concentrated on how consumers may obtain and use information through formalized frameworks for information provision. The TII concept demonstrates the level to which information can be obtained and exploited for successful and gratifying accomplishment of ones' aims.

The TII was chosen because it is based on the fundamental division between the views of the information supplier and the user. The information specialist oversimplifies, strives for a standard, and reacts to the public sphere insufficiently positively. On the other hand, prior to the information exchange, the user, which is academic personnel, assumes several contextualized responsibilities and varies in their level of competence. The perspective of

the user, who is academic staff, is multifaceted, rich, and complicated, and it varies depending on how important and necessary the knowledge is to become highly informed. The theory was adopted because it resonates well with academic personnel and other information users who rely on existing systems or services.

Digital resource platforms have been established to provide users with easy and fast access to information. The platforms are also meant to break barriers to information access caused by distance and geographical locations and provide equal opportunities to all information seekers. However, access to and utilization of these resources is ineffective and hence affects the delivery on teaching and research in universities. Thus, this study aimed to offer a means of encouraging and improving information access and use in digital resource platforms found in Kenyan university libraries.

2.4 Digital Resource Platforms

Digital resource platforms are collections of digitally recorded information resources that are accessed over a computer network and are systematically organized and regulated. According to Omette (2016), digital resource platforms are collections of information resources that are digitally stored and organized and may be accessed over a computer network. A coherent organization and easy access to normally huge amounts of digital information are provided by the digital resource platform, an integrated set of services for information collection, cataloging, storing, searching, safeguarding, and retrieval (Khan & Bhatti, 2018). Academic definitions of digital resource platforms include digital collections of digital objects such as text, still photos, audio, video, digital documents, or other digital media formats or an online library (Venkatesh, Thong & Xu, 2016; Xu & Du, 2018; Okeji & Mayowa-Adebara, 2020; Bosire, 2021).

According to Xu & Du (2018) digital resource platforms within institutions can be described as software designed to assist during the educational process within the institutions. Digital resource platforms, according to Domitrovich, Durlak, Staley, and Weissberg (2017), offer educational experiences that let users actively interact with instructional content. However, Joy (2016) describes digital resource platforms as electronic or virtual libraries that teachers use to start more engaging learning activities. Since the material on these digital resource platforms is not available in print form and they do not exist in a physical location, they are wallless. People can use the digital resource platform to access and use Internet material whenever it's convenient for them. Platforms have revolutionized how people obtain information for education and making decisions (Waithaka, Onyancha & Ngulube, 2018). This has had a substantial impact on how education is delivered across all platforms, including mixed, online, and offline learning (Venkatesh, Thong & Xu, 2016).

Regarding how to communicate, exchange, and interact with students while presenting various ideas, facts, and theories, teaching staff now has a plethora of options thanks to digital platforms in education (Delaney & Bates, 2015). Edem and Nsanta (2016) suggest that education and training programs can make greater use of digital resource platforms to engage students of all ages. They make it easier for students and teachers to share course materials via computer and tablet devices or to create online discussion boards where they can exchange opinions about a specific topic (Firozjah, Dizaji & Hafezi, 2019). The use of digital media in instruction and training is thought to help students get ready for the workplace, where information technology (IT) and digital platforms are routinely used to complete daily activities (Gilbert, 2016).

2.4.1 Structure of Digital Resource Platform

The revolution in ICT, specifically the World Wide Web (WWW) has brought about the evolution of digital content in libraries which mark the beginning of the information era.

University libraries now acquire different formats of digital resources and provide access to the resources via computers. Figure 2.2 is a representation of a digital resource platform.

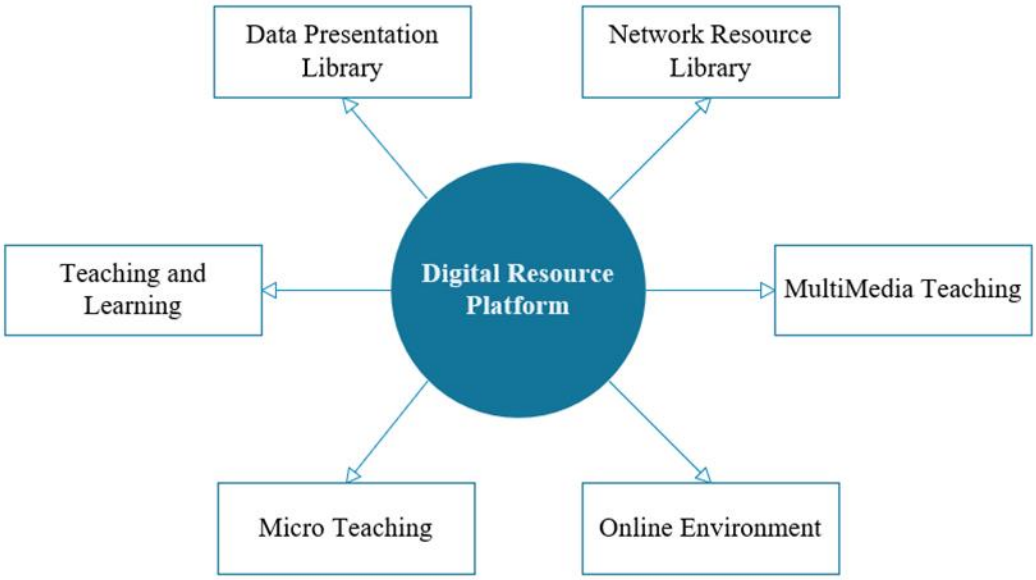


Figure 2.2: Digital resource service platform

Source: Yang, Lin & Tong (2023)

Universities can more easily access digital sources of knowledge for teaching, learning, and research thanks to digital resource platforms. Digital resources are any resources that need computer access or any electronic device that provides a set of data, according to Kenchakkavar (2014). These consist of full-text databases, electronic journals, picture

libraries, and graphical and numeric multimedia applications. Proxy services enable remote access to e-content in the Digital Education Resource Service Platform (DERSP). According to Yang, Lin & Tong (2023) e-books, e-journals, databases, webpages, online audio and video are the different online digital resources of the digital library. Digital resources are accessible from anywhere at any time. Numerous digital materials are available for use on the unique theme and user-friendly digital resource service platform.

The platform's goal is to increase the rate of access to and use of all digital educational resources. Bag (2022) claims that the machine learning (ML)-based digital resource service platform has a 90% access and utilization rate for all types of digital education resources and improves resource utilization.

Easy access to information is contingent upon the administration of digital resource platforms. For quick access by the intended audience, content on a digital resource platform is arranged and controlled (Iroaganachi & Izuagbe, 2018). For digital content services to be successful in the long run, how material is created and managed is crucial, particularly in situations when technical resources are scarce. (Katabalwa & Underwood, 2017; Omah, 2019; Xie & Matusiak, 2016) Content management include selection and acquisition, indexing, storage, retrieval, maintenance, and rights management. Libraries choose and acquire materials in accordance with a clearly defined collection development policy (Khan & Bhatti, 2018). In addition, maintenance and digitization costs need to be taken into account, along with intellectual property rights (Zhang, Liu & Mathews, 2015). When purchasing digital content from libraries, it is crucial to give careful thought to the content's

quality. Universities have set up institutional repositories to make information easier and faster to access.

2.4.2 Indexing of Digital Content

Indexing is necessary for digital content in order to enable selective searching and access, such as the Online Public Access Catalog (OPAC) for printed material (Katabalwa & Underwood, 2017). It is necessary to make decisions about what will be indexed, such as the author, keywords, and phrase, as well as the type of access points that will be offered and the connection between the content and index files. The indexing method includes both the kinds of fields to be indexed and the treatment (sparse or exhaustive) of those fields (Iroaganachi & Izuagbe, 2018). The majority of the time, text elements like the title, author's name, or manually supplied subject headings are used by retrieval systems to obtain photos, videos, audio recordings, and other non-textual objects (Larson, 2017).

The digital platforms' indexing of its material facilitates easy retrieval and unrestricted access (Anyim, 2018). Information storage is another aspect of digital content management to consider. At this point, choices must be made on the acquisition of appropriate hardware, software, and networking (Madu, Vadu, & Chagwa, 2018). While new media may make storage options and costs more complex, storage is mostly a technological issue. Large digital repositories are necessary for mechanical robots to find and mount the media as well as for various degrees of mass storage media, such as disk and tape (Mishra, 2016). To guarantee data security, libraries must create the best storage systems possible (Edem & Nsanta, 2016).

Furthermore, retrieval is a significant problem when it comes to digital content and access. According to Omah and Urhiewhu (2019), the computerization of cataloging and circulation functions improves user access and services. In order for users who are located remotely to locate and view primary information objects in addition to bibliographic data, it is expected that the catalogue for digital collection will seamlessly link to the digital material itself (Rahman & Mohezar, 2020). Using a range of access techniques, the digital resource platforms provide primary content access (Uugwanga, 2017). Access interfaces act as a link between internal (technical services) and user services, relying on how content is organized and stored.

Also, maintaining buildings and systems and conserving content are crucial and costly activities in physical libraries (Shboul, 2016). While some of the costs associated with building and book wear and tear may be avoided by digital resource platforms, they still have substantial maintenance costs specific to electronic environments, where new hardware, better or different network solutions, and software upgrades necessitate highly skilled technical personnel (Wissel & DeLuca, 2018). Traditional maintenance requirements are met by maintenance difficulties, which are applicable to a wide range of businesses and demand expensive, quickly evolving technical expertise. While maintaining content has received a lot of research and development attention in digital libraries, security, version updates, link checking tools, and database tools for property rights are still areas that need to be improved for seamless library operations and services (Sejane, 2017).

According to Kaucanen and Nieminen (2018), research and development in the field of digital content management are influenced by two interrelated worldwide issues:

intellectual property rights and information security and authority. Economic incentives are provided by copyright to encourage intellectual production. The administration of digital content is complicated by a number of legal considerations. The trustworthy system, which also safeguards intellectual property rights and prevents unauthorized users from accessing the websites, was developed as a result of research on encryption algorithms, digital watermarking, and electronic commerce (Kautonen and Nieminen, 2018).

2.4.3 Importance of Digital Resource Platforms

The ability to access information at any time and without restriction on the number of users is one of the many advantages of digital resource platforms (Okemwa, 2016). According to Kibuku, Ochieng, and Wausi (2020), digital resource platforms facilitate numerous accesses to information sources, hence streamlining keyword searches for information. A keyword search for the required content gives the user options in addition to directing them to the precise content. Large amounts of information can be accessed more easily and stress-free thanks to digital platforms (Appleton, 2016).

Education, training and research can maximize the digital resource platforms to retain better learning and development of all generations (Edem & Nsanta, 2016).

According to Firozjah, Dizaji, and Hafezi (2019), digital resource platforms facilitate the sharing of instructional materials via computer while tablet devices as well as online forums where students and professors can exchange thoughts on a given subject or topic. Moreover, the digital platform facilitates data retention and preservation, and the digitalization process makes text in books and other printed reading materials easier to read (Omah & Urhiewhu, 2019). Because they enable academic staff to access scholarly publications that support high-quality instruction, productive research, and development

activities at universities, and because they give academics electronic access to information resources covering a wide range of subject areas, digital resource platforms have become essential elements of teaching, learning, and research activities.

Furthermore, according to Xie and Matusiak (2016), digital platforms are made to maximize user time, increase access to information resources, enable simultaneous users to access collections, and provide a complete set of cumulative information services that are available around-the-clock, regardless of the location of the users. Academic staff members no longer have to spend as much money, time, or effort traveling great distances to obtain information from physical stations in order to do their task, which has reduced their workload.

According to Anyim (2018), better access to digital information resources fosters more effective information delivery to all users and improves research efforts. Multimedia content is included in digital resource platforms, which are utilized to deliver quick access to digital information (Owolabi et al., 2016). They make it easier to access a variety of material and provide an almost limitless amount of options and resources (Veena, 2016).

Because they provide current content and instant access to a variety of sources that are not physically available, digital resource platforms are essential for education (Daramola, 2016). Digital resource platforms make information access more autonomous by providing resources via an internet connection at all times and from any location. Researchers may access a tremendous amount of information and share content with others, supporting the expansion of knowledge. The platforms for digital resources make it easier to preserve cultural legacy for future generations (Okemwa, 2016). According to Uugwanga (2017),

these platforms benefit the scientific community by serving as a repository for crucial research data, information, and discoveries.

Physical records of scientific studies and researches for a long time lived with a severe issue of either getting destroyed or lost (Zerehsaz, 2017). To build a virtual knowledge legacy for future generations, studies and researches' digital copies might be preserved and gathered (Tilley, 2016). According to Wang (2016), the issue of deterioration is resolved by digital storage of books and audios, enabling continued use. Audio cassette tapes and vinyl records are shared by several users in traditional libraries, which presents a challenge in terms of resistance to wear and tear. Antique documents or delicate photos must withstand multiple handovers and discussions without breaking or suffering other damages (Zha et al., 2020). However, digital platforms are significantly safer to utilize and provide for many access to content whenever needed. The most encouraging development is that, in order to facilitate access, searching functions are becoming increasingly sophisticated as digital collections become more widely used (Daramola, 2016).

2.4.4 Establishment of Digital Resource Platforms in Universities

For a number of years, distance education has been incorporating digital resource platforms, such as digital libraries, into the teaching and learning process (Omah & Urhiewhu, 2019). The use of digital platforms in education has fundamentally altered classroom dynamics in ways that could have a significant impact on both teaching and learning. Educational applications of digital platforms range from primary schools through graduate schools and across all disciplines (Appleton, 2016). Digital resource platforms change the possibilities for the education information space. Institutions have advocated

for the establishment of digital resource platforms to enhance access and utilization of information for effective teaching, learning and research activities. The use of digital resource platforms in universities has grown rapidly all over the world and instructors are using a new generation of software products designed to enhance access and utilization (Gokoffski, Chatterjee & Khaderi, 2019). Instead of using printed physical materials, information users may use their laptops, tablets or even smartphones to complete access and read information that includes video demonstrations.

Academic institutions such as the International Institute of Information Technology, Hyderabad (IIITH), Carnegie Mellon University (CMU), and the Indian Institute of Science (IISc) have partnered with the Digital Library of India (DLI) to preserve Indian heritage through books, manuscripts, art, and music, with each center/institution contributing its own collection (Hadimani, Mulla, & Kumar, 2015). As a pioneer in global endeavors to disseminate knowledge, the Indian Language Research Institute (DLI) uses its digital library as a test-bed as well.

In the USA, California University developed the University of California system, which is a digital resource platform that is accessible all over the world (Gokoffski, Chatterjee & Khaderi, 2019). In the Netherlands, Tilburg University developed the University of Tilburg Library (Zhang, Aerts & Pan, 2019). In England, Oxford has Oxford Digital Library (ODL) that was established as a core service to provide information to the students and also the staff within the institutions. The Harvard Digital Collections is key in enhancing online information access within the Harvard University (Marsh, Punzalan, Leopold, Butler & Petrozzi, 2016). These digital platforms facilitate the storage of the digital information accessible through the internet all over the world. Digital platforms are also important

mechanisms for developing countries in their struggle to overcome the challenges of quality education within the institutions of higher learning (Abubakar & Akor, 2017).

The African countries face difficulties in putting their scarce resources into building digital resources and notably digital libraries. Apart from the inadequate financial resources, developing countries face several other problems including poor internet connectivity, low ICT resources and infrastructures. However, some of the institutions within the countries have developed digital resource platforms to facilitate access to information. By converting the majority of its material to digital format, the University of Johannesburg Library in South Africa has made it easier for patrons to access the materials inside (Swartz, Ivancheva, Czerniewicz & Morris, 2019). The University of Ibadan was the first institution in Nigeria to employ microform technology in libraries, which has enhanced information access (Kanya, 2020).

In Kenya, there are more digital resource platforms commonly known as repositories. Most of the universities have repositories that have enabled easy access to information (Kibuku, Ochieng & Wausi, 2020). The University of Nairobi digital repository, Egerton University Institutional Repository, Kenyatta University Repository, Moi University Institutional Repository among others, are the main sources of digital information within the universities (Makokha & Mutisya, 2016). A repository is a system for networked-based storage and access to digital objects. Most universities in Africa, including Kenya have repositories that are a form of digital resource platforms (Chemulwo, 2018). In the Kenyan scenario, the repositories are hosted on the university's websites for easy access to digital information.

2.4.5 Information Access in Digital Resource Platforms

Access to information in digital resource platforms is one of the key fundamental aspects that determine the usability of the platform (Domitrovich, Durlak, Staley & Weissberg, 2017). Access can be defined as the ability to participate or engage in digital platforms fully.

For complete engagement, this includes having access to the content that is kept on digital platforms. According to Waithaka, Onyancha, and Ngulube (2018), information access is the freedom or capacity to locate, acquire, and apply a database or information efficiently. Numerous topics are covered, such as security, privacy, copyright, and open-source (Bosire, 2021; Zhang, Liu & Mathews, 2015). Access is defined as a person's capacity to find essential services or content easily, quickly, and at a reasonable cost (Iroaganachi & Izuagbe, 2018). Adequate access to information is dependent on the knowledge and ease to navigate the massively available information to get relevant information for use (Xie, Babu, Lee, Castillo & Hanlon, 2020). The proliferation of technology has enabled production, packaging, dissemination and access to information electronically. These capacities have led to the development of database technology and consortium building among academic libraries to offer access to collective information resources through different forms of subscription (Albertson, 2015). The empowerment of users to access digital information is essential for any development in all areas of life since the information that is not accessed serves no purpose. Abubakar and Akor (2017) observe that access is a pathway to quality information of which, if denied, developmental information is lost.

Digital resource platforms are developed to provide limitless access to information by all users regardless of their geographical location (Idiegbeyan-Ose, Nduka, Adekunjo, &

Okoedion, 2015). This can only be enabled through the development of a suitable user interface environment that supports users seeking to access information in these libraries. The rapid growth of information technologies, new types of software products and databases that have emerged and digital resource platforms (Zerehsaz, 2017) users are confronted with different user interface environments that are unclear to them. Information professionals are therefore expected to take center stage in ensuring designers considers user-friendly interfaces. Academic staff need help guides that support the information access process (Okeji & Mayowa-Adebara, 2020) to improve access and utilization of information in digital resource platforms. This will encourage users and also facilitate ease in navigation in the advent of changing technologies.

Furthermore, assessing new technology without considering its actual users may be challenging. In addition to supporting communication and collaboration among academic academics to set the pace for the creation and distribution of knowledge, information access is thought to enhance the efficient transmission of information to all users in an economical manner (Bakare, 2018; Gokoffski, Chatterjee & Khaderi, 2019). Academic staff at universities will be able to create lesson plans, carry out research, and effectively share knowledge thanks to the ease with which information can be accessed on digital resource platforms (Bowen, 2018). For this reason, it is necessary to encourage and improve access to and utilization of information on digital resource platforms.

2.4.6 Utilization of Information in Digital Resource Platforms

In an effort to promote teaching, learning, research, and innovation, electronic material has grown to constitute a sizable portion of the university libraries' collection. Higher education institutions' usage of information is changing as a result of the expanding digital era, which

is best demonstrated by the applicability, accessibility, and use of electronic information resources in research settings for instruction. The creation and use of digital materials in university libraries has been facilitated by the advancement and application of contemporary information technologies. According to Odunlade (2017), using e-resources is the procedure that gives researchers access to hard copy, online, or digital information quickly and effectively in order to improve the caliber and efficacy of their research projects. Utilizing electronic content enhances research production since the resources offer a current and broad range of literature, giving researchers the chance to spot knowledge gaps.

By using digital content, researchers can more easily access the work of the international scientific community and use validated scientific knowledge to their research (Sejane, 2017). In essence, research and the publishing of research findings are scholarly processes by which scientists find new ideas and use those ideas to advance our understanding of the world. Alhassan and Macaulay (2015) observe that academic staff in universities frequently use information for teaching, research and innovation. The authors further observe that the staff use information from electronic journal, electronic thesis, electronic books and also print books. Song and Song (2017) corroborated this claim, adding that since the advent of information communication technologies, academic staff members have become more adept at using electronic information resources rather than traditional print ones. Academic staff members' use of information has been significantly impacted by ICT use since it makes information easy, quick, and handy to access.

Additionally, in a study on the use of electronic resources by academic staff at the University of Ilorin Tella, et al. (2022) revealed that the effectiveness in the use of information and specifically in digital environments had been hampered by lack of ICT skills that facilitate access to information for use. In agreement with Tella (2022), Ratanya and Muthee (2018) note that academic staff does not effectively utilize information in the institutional repositories because of fear plagiarism and inadequate digital literacy skills. Utilization of information goes hand in hand with access to the information.

Ineffective access to information negates its usage hence the motivation for this study to provide a mechanism for promoting and enhancing access to improve utilization. The types of digital resource platforms in university libraries include the OPACs, institutional repositories and library websites. The structure of the platforms has user interface, handle system and search system which allows users to choose where to search for information and what to retrieve for use. To facilitate searching and access to the needed information the content is indexed to provide search terms for users. Digital resource platforms present various benefits including fast, limitless real-time access to information and sharing. Universities have established digital resource platforms so as to enhance access and utilization of information to support teaching, learning and research. This can also be achieved by providing an appealing visual design in digital resource platforms.

2.5 Visual Design in Digital Resource Platforms

Visual designers strive to improve the visual attractiveness of a website and its contents by carefully choosing images, colors, fonts, and other elements (Anyaoku, Echedom & Baro, 2018). Without taking away from the page's functionality or information, a well-designed

visual design improves it. Instead, it enhances it through user interaction, the development of trust, and interest in usability (Azadbakht, 2017). Customers with a range of psychological, instructive, social, and informational needs can access a multitude of online multimedia content through a single point of entry thanks to digital platforms (Handa & Bhatt, 2015). Individual variations result in varying biases or preferences in the discipline of graphic design.

According to Xie and Matusiak (2016), understanding users and their goals, the context and setting in which they will use the platform, as well as the logistical and technical feasibility, are all necessary for creating well-designed, useable digital resource platforms. Digital resource platforms are interactive systems with a growing user base. Designers need to make sure that their interactive systems incorporate high-quality design features in order to make them both beneficial and usable. This means considering the needs and cultural backgrounds of users in order to facilitate access (Venkatesh, Thong, & Xu, 2012).

In a time where people's attention is continuously drawn to digital screens, Bowen's (2018) study suggests that for university libraries to serve as a research resource, its information needs to be visible to users. According to Firozjah, Dizaji, and Hafezi (2019), electronic platforms should make their resources and services simply accessible and useable. This is shown in the visual design and layout of the resources along with services on the library's website. In a similar vein, Wissel and DeLuca (2018) confirmed that how content is arranged and visually designed has a direct impact on how well people view libraries as informational resources. Making sure that digital resource platforms have visually appealing designs is essential since this will encourage people to access and use the resources.

Digital resource platforms offer chances to enhance a library's intended attributes by giving users a pleasing visual experience through the use of images, design, and text. According to Gaona-Garcia, Martin-Moncunill, and Montenegro-Marin (2017), users have trouble incorporating visual search interfaces into online repositories and libraries. They specifically consist of metadata quality, information visualization, and the application of knowledge organization systems. Visual design can be used as a principle to make a digital platform and its resources visible, findable and usable to users (Chemulwo, 2018). Additionally, the visual design of library websites including color and content design is very important for attracting users' decision to pursue the information or not (Kautonen & Nieminen, 2018). Poorly designed content, an unfriendly interface, unappealing colors (dull or faint) demoralizes users from accessing digital information (Anyaoku, Echedom & Baro, 2018).

Users will be encouraged to obtain information if the content is methodically arranged, for instance, based on disciplines, and if the interface is user-friendly, well-illustrated, and has visually appealing colors (Weng'ua, Rotich, & Kogos, 2017). Information must be efficiently organized by designers and represented digitally via computers (Bosire, 2021).

Well organized content enables users to navigate through the digital resource platform moving from one database to another and from one source to another with ease. Besides, websites provided by academic libraries are challenged by the fast growth in ICTs that have created various alternatives and channels for information sources that are easily accessed through the Internet (Katabalwa & Underwood, 2017). However, in some cases, users of digital resource platforms are challenged with the complexity of finding information and those related to the organization of content on library websites causing users to rely on Google (Lee & Kim, 2021). The reliance on Google may compromise the quality of information academic staff access and use. This is due to the possibility that the data is not always reliable and could have an impact on their research and teaching output (Gokoffski, Chatterjee & Khaderi, 2019).

Content that is easily accessed and used and is well-organized may draw in academic workers. Furthermore, the main focus of visual design is on whether or not a viewer can use a website for the reasons for which it was intended given its observable style and content. According to Comeaux (2017), digital resource platforms can leverage visual design to lessen the cognitive burden that users must endure in order to comprehend and process the website, allowing them to use it more effectively and efficiently. Since the websites of digital platforms serve as virtual public faces, they ought to have some identity and entice users to return. According to Bowen (2018), a website's visual design influences how users who have engaged with it accept and recommend it. A library's website's navigation system is directly influenced by its graphic interface, which also affects the site's usability and aesthetic appeal, which draw users in and encourage access to information (Guchacha, 2019).

According to Sandnes (2020), despite the establishment of a sizable digital content resource with a vast user base, there is still work to be done in creating suitable infrastructure to support global access to and utilization of the expanding digital information landscape. According to Waithaka, Onyancha, and Ngulube (2018), digital resource platforms are developed in response to the demands of a specific user community, whose input should be sought early on to promote user-centered design. This will make it easier for people to adopt, comprehend, and use the system. However, as noted by Bader (2018), when digital libraries are deployed, users are often left out of the design process.

The idea that visual design principles are means by which Web design may be developed further links these principles to the field of libraries, which has acknowledged constructivism and visual literacy as two of its core beliefs (Makokha & Mutisya, 2016). Academic librarians ought to approach the design and usability of library websites with a relaxed attitude. For example, visual design can be considered in terms of content arrangement, images, color, and search tools. This has been noticed by Zhang, Liu, and Mathews (2015); Comeaux (2017); Barifah, Landoni, and Eddakrouri (2020); Zha, Wang, Yan, and Zhang (2015); and Khan & Bhatti (2017).

2.5.1 Layout of Content in Digital Resource Platforms

This relates to how the content and images are arranged on the webpages. Layout has a big impact on how effective any kind of design is, from print to digital (Khan & Bhatti, 2018). A webpage's acceptability is increased when related items are grouped together on the page. Whether or not the highlighted item is used can depend on where the banner is placed on the page and how close or far it is from other items (Agosti, Ferro, and Silvello, 2016). The best websites for fulfilling their objective without coming across as unduly

complicated are those that have just the right amount of text and images to convey the information users need to know (Omette, 2016). The design of the layout should take into account the resources that users would like to see on the homepage of the library, the length of a page before it becomes cognitively overwhelming, and the number of elements that can be seen on a page without making it appear cluttered (Xie, Babu, Lee, Castillo, You & Hanlon, 2020). The appropriate balance of text and graphics should be taken into account, as well as how the elements' spatial location can effectively showcase library resources and services.

In addition to being aesthetically pleasing, an efficient layout aids the user in understanding the message being sent by the design (Owusu-Ansah, Rodrigues & Van Der Walt, 2018). Stated differently, designing interesting and user-friendly designs—especially in the context of online design—requires a solid understanding of layout. According to Domitrovich, Durlak, Staley, and Weissberg (2017), the layout design plays a crucial role in organizing the content on a website for both the website owner and users. It prioritizes the most crucial components of a website and offers unambiguous routes for navigating between pages. Website layouts specify the hierarchy of material that directs users of digital resources through the website.

2.5.2 Images

Because they draw a visitor's attention to the website, images are essential to websites (Anyim, 2018). Images that are relevant and intended to look good improve the user experience. They provide a pertinent message in response to the information request. Users' interpretations of website designs, and specifically the photos shown on these sites, are

influenced by the images on them (Al-Saleh, 2016). According to a study by Azadbakht et al. (2017), graphics help break up text blocks on web sites so that users may more quickly absorb the information offered there. Chowdhury (2016) connects constructivism to visual imagery, particularly photography, on library websites by concentrating on the images themselves.

Daramola's (2016) observation is consistent with the findings of Iroaganachi and Izuagbe (2018), who found that visitors are more likely to view a website as valuable if it has a contact person's picture rather than none at all. The image makes it simple to determine the location of the information. According to Anuradha (2017), when utilizing a library website, patrons value being able to see the librarians they contact with visually. Therefore, it can be said that the websites' visuals have a strong effect on increasing their visibility.

2.5.3 Color

Online success depends on selecting the appropriate colors for the website's design. The most effective way to elicit a response from the intended audience may be through color (Larson, 2017). Users' emotions can be evoked or a call to action can be triggered by the colors of websites or digital resource platforms (Madu, Vadu & Chagwa, 2018). Compared to colorless (black and white) visuals, people can process and store images more quickly when they are colored. This has the potential to improve brand recognition and encourage more consumers to take action on the website. Subconsciously, judgments can be made based on website color schemes. It has been demonstrated that the use of color in educational materials is crucial for evoking various emotional responses and holding

students' attention (Niqresh, 2019). The website's color scheme has a significant impact on how appealing it is to users.

The importance of color design stems from the significance of color to the human mind. Color creates ideas, expresses messages, sparks interest, and generates certain emotions among the students and even the lecturers (Omah & Urhiewhu, 2019). Color affects behavior as well as cognitive abilities, performance, and intentions of the users of particular content (Blake & Gallimore, 2018). Some scholars (Petronilla, 2016; Khan & Bhatti, 2018; Agosti, Ferro & Silvello, 2016; Zha, Wang, Yan, Zhang & Zha, 2015; Appleton, 2016) observe that colors help learners increase their arousal. Delaney and Bates (2015) indicate that color portrays different meaning and thus an organization needs to look for a universal color. According to a study by Plass, Heidig, Hayward, Homer, and Um (2014), using warm colors in materials—like yellow and orange—instead of cool ones—like gray, can improve students' learning. Colors also have different meanings in different cultures and therefore their choice must be well thought.

2.5.4 Search Features

The search features are important in helping the website users to find relevant content by specifying keywords or phrases without navigating through the entire website (Domitrovich, Durlak, Staley & Weissberg, 2017). Beyond online catalogues, databases and e-journals, researchers start to place their pre-prints or post-prints on the websites of faculties and research groups. A well-designed search system will help those looking for particular information to have ample time of locating to the exact information (Kamau, 2018). The search system is fundamental for looking for information from the websites of schools or universities (Xie, Babu, Lee, Castillo & Hanlon, 2020). A reliable search system provides a list of results that best match what the user is trying to find out from the Internet (Rahman & Mohezar, 2020). Typically, a series of results known as search engine results pages (SEROs) display the search results (Katabalwa & Underwood, 2017; Omah & Urhiewhu, 2019). Crawling, data mining, indexing, and query processing are the fundamental operations of a search engine (Habiba & Ahmed, 2020; Tutu, 2018).

According to Firozjah, Dizaji, and Hafezi (2019), data mining is the process of storing the information gathered by small, programmed bots, whereas crawling is the act of sending the bots out to collect information. According to Lee and Kim (2021) indexing is the systematic ordering of data. Last but not least, query processing is the mathematical procedure that compares a user's query to the index and displays the results to the user. Search engine results pages are the outcome of displaying the search results in a list format (Okeji & Mayowa-Adebara, 2020). Search engines retain real-time information by using an algorithm on a web crawler, as opposed to web directories, which are updated solely by

human editors (Singeh, Abdullah & Kaur, 2020). Users of digital resource platforms can still obtain and use information more efficiently thanks to search features.

Visual design in digital resource platforms strategically uses images, colors, fonts and other elements for aesthetic purposes. Studies have shown that the key indicators of an appealing visual design are four that is, layout of content, use of images, use of color and search features. The content should be systematically arranged to facilitate easy access and retrieval for use. Images helps in breaking blocks of text that could cause monotony to the reader while it enhances the identification of information especially where a contact person's picture is embedded. The use of color in the platforms steer emotions of users to swing to action and also increase brand recognition. Colors that do not look attractive to the users' eye are likely to affect access and use of information in digital resource platforms. It is also imperative that users be provided with simple and clear search features to facilitate navigation through databases.

University libraries have established digital resource platforms to facilitate access and utilization of information. However, it is not clear in literature whether the presentation of content in these platforms facilitate access or not particularly with regard to the four major indicators hence the motivation for this research. Also, access to digital content requires technical skills to enable users effectively find the needed information. Digital literacy skills are a pre-requisite among users in digital resource platforms.

2.6 Digital Literacy Skills among Academic Staff

Technology is penetrating every element of our life so the skill to navigate and successfully perform tasks using technology has to improve. People need to be able to learn and operate in a society where digital technologies like social media, mobile devices, and internet

platforms are boosting communication and information access (Veena, 2016). Information consumers who possess digital literacy are more equipped to capitalize on the plethora of fresh and developing opportunities that come with digital technologies. Digital literacy, according to Nwafor, Uchenna, and Chika (2018), is the "savviness" that enables people to engage in society securely and productively as digital technology becomes more and more ingrained. According to Anyim (2018), digital literacy is the capacity to create, investigate, and communicate using the right tools; to interpret, comprehend, and evaluate digital content; and to use technology properly. It's a type of literacy that lets people use a variety of digital tools to efficiently and critically navigate, assess, and generate information.

Given that it facilitates quick access to information and enhances service delivery, digital literacy can be a very useful asset on digital platforms (Katabalwa & Underwood, 2017). The ability to find, assess, use, and generate information using digital technology, communication tools, or networks is known as digital literacy. Digital literacy encompasses the ability to obtain information in digital formats, assess it, and utilize it suitably (Mishra, 2016). It is universal to all disciplines, learning environments, and educational levels (Okemwa, 2016), serving as the cornerstone for lifelong learning regardless of a person's field of study, educational background, or setting.

Digital literacy enables users to effectively use the mass of digital information resources (Uugwanga, 2017). Users who lack digital literacy skills may find it challenging to navigate a world of information sources in digital resource platforms.

Gilbert (2016) observes that due to lack of digital literacy skills to navigate various e-portals, databases, users may conclude that the library is of no value and hence affect the

teaching and research work. The usability of digital resource platforms depends to a large extent on user searching skills. Jabeen (2017) opines that digital library users should be competent in creating, searching, using, retrieving and modifying information from the digital library. Academic staff needs the necessary skills and capacities of know-how to effectively utilize digital resources (Egchukwu, 2015).

Academic libraries have embraced the digital era by automating library services to improve their collection and public access to pave the way to the utilization of their resources. The academic staff needs to be digitally literate to operate and access information in digital resource platforms. According to a study by Ani and Ani (2016), academic staff members find it difficult to use digital platform resources because e-content is not easily accessible. This is in contrast to internet search engines like Google and Yahoo, where a single keyword search can yield thousands of results regardless of the topic. The academic staff with inadequate digital literacy skills may experience serious challenges in accessing digital information because it requires specific keywords or a combination of terms to find relevant information (Owolabi et al., 2016).

According to (Edem and Nsanta, 2016), academic staff members lack the digital literacy abilities necessary to access content in digital libraries. Low levels of digital literacy limit academic staff members' access to pertinent material that supports their teaching and research, which lowers the caliber of their instruction and research output (Kwanya, 2016). Egchukwu (2015) found that inadequate access to and utilization of technological resources in underdeveloped nations has an impact on educational standards.

Academic staff members' low levels of digital literacy impede their ability to obtain knowledge on digital resource platforms and stunt their professional development (Katabalwa & Underwood, 2017). Academic staff members' digital literacy is essential for encouraging the use of information on digital platforms. To guarantee that these potent media and technologies are used responsibly and ethically, the dynamic new world demands new comprehension and communication abilities in addition to new norms of conduct (Zha et al., 2015).

2.6.1 Importance of Digital Literacy

Having the right digital skills is not only essential for academic staff, but also has significant benefits for learners. It is crucial to strengthen the skills of the academic staff to enable them to use the technology more effectively and promote higher student interaction. Digital literacy is an essential tool to facilitate academic staff to access digital information (Delaney & Bates, 2015). Library employees, both professional and paraprofessional, must adapt to the rapidly changing technologies (Blake & Gallimore, 2018). To obtain the necessary information, users of digital platforms must possess digital literacy abilities (Hilliard, 2015). These abilities will make academic staff and students more capable of engaging in a variety of digital-oriented activities, such as blogging, social networking, resource sharing, internet browsing, instant messaging, and much more (O'Connor & O'Hagan, 2016). By providing libraries with digital resources for sufficient learning and by educating and developing librarians, it is possible to increase the literacy of users of digital resource platforms (Anuradha, 2017).

When it comes to performance and development when using digital resource platforms, digital literacy is a terrific tool. ICT strategies that promote ICT applications, increase

access, foster reform, and enhance ICT human capacity are effective in developing users' abilities and therefore encourage increased use of digital platforms (Kautonen & Nieminen, 2018).

Digital literacy is crucial and enables users to have an easy time looking at the documents they want. Thus, it is possible that the digital resource platform usage can be determined by the extent of the skills of those using it (Daramola, 2016). The librarians and academic staff need to be more engaged to grasp skills that are necessary for enhancing their competency level and use the digital platforms more efficiently (Edem & Nsanta, 2016).

2.6.2 Digital Literacy Competencies

Technological advancements in digital systems have made it possible for educational institutions and information management companies to access information in virtual settings. According to Larson (2017), digital competency entails using information society technology (IST) for work, play, and communication with confidence and critical thinking. It is based on fundamental ICT skills, such as using computers to interact and take part in online collaborative networks as well as to retrieve, evaluate, save, create, display, and exchange information. Digitally competent people are able to locate, handle, and modify digital material as well as use the Internet. Additionally, they can interact with internet information and communication networks and participate in communications (Falloon, 2020). These users possess the capacity to apply digital tools, resources, and services to processes of lifelong learning in an appropriate and effective manner.

Proficiency in digital literacy is essential for everyone using technology these days, but especially for academics. Makori and Osebe (2016) note that global digital initiatives that

are embedded in and supported by libraries are used by academic and research institutions, information management organizations, and mass centers of intellectual alongside scholarly communication to create and disseminate knowledge. When the participants lack sufficient digital literacy, these efforts will fail. In the information era, people who use digital tools have evolved into active, participatory people who produce, process, and gather information (Keskin, Ozata, and Banar 2015).

A person who is digitally literate makes good use of technology to conduct research, locate information sources, read, write, and comment effectively, as well as to make defensible decisions. Digital literacy fosters creativity and curiosity while empowering the user to critically assess the information they have gathered (Mishra et al., 2017). Digital literacy enhances one's capacity to use digital resources and contributes to one's feeling of relative security when using technology. To use and manage the various and loose information network with the aid of technology, many people do, however, require training (Rodovanovic, Hogan & Lalic, 2015). The competencies related to digital literacy are depicted in Figure 2.3.

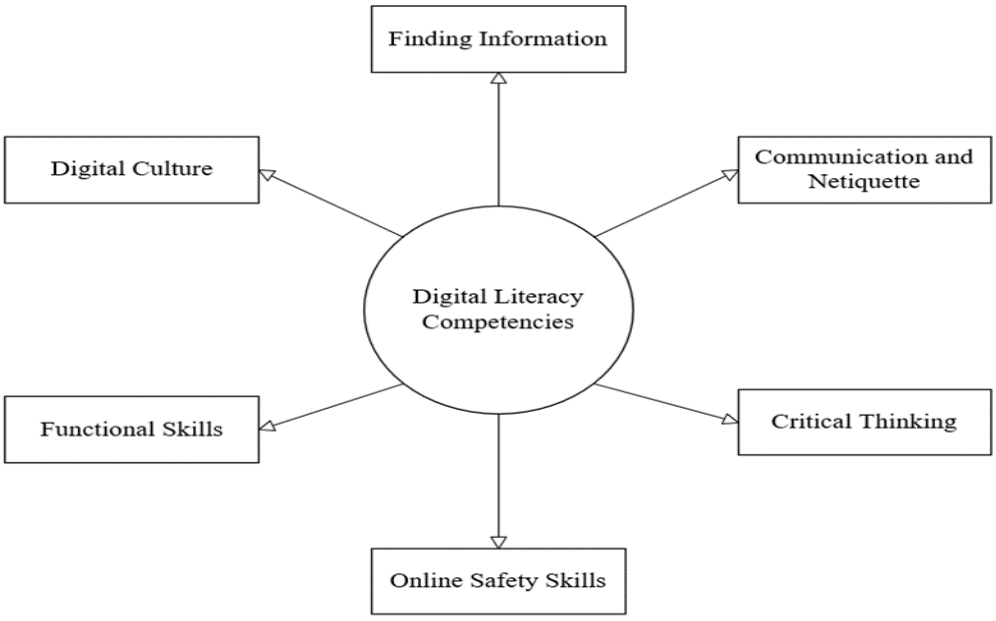


Figure 2.3: Digital Literacy Competencies

Source: Adopted from Digital Literacy for SCONUL 7 model of IL.

Finding information and choosing pertinent information: users now have access to a multitude of information thanks to the Internet. People practically have too much information to pick from, which is the issue with this. Differentiating between biased viewpoints, false information, and factual information can be challenging at times. Tang (2015) notes that the majority of people rely too much on search engines to conduct the sorting. Users must be able to conduct accurate searches and apply critical thinking to assess the material they find. Users may depend on a fast Google or Wikipedia search, followed by copying and pasting, when conducting independent online research (Loh et al., 2016). This raises concerns about plagiarism because it may indicate a lack of understanding about appropriate online research techniques. Academic staff members

should be proficient in finding accurate and trustworthy information because it is an essential research tool.

The capacity to think independently and come up with solutions to issues is known as critical thinking. According to Mishra et al. (2017), in order to think critically, a person must be able to assess and analyze arguments and information, recognize patterns and connections, and create and construct meaningful knowledge. After that, the knowledge must be put to use in a practical setting and expressed in the learner's own words. To make the most of digital technology and comprehend the abundance of information available online, academic staff members must cultivate critical thinking abilities. According to Nwafor et al. (2018), people that engage in critical thinking and assessment are less passive when consuming information. They might also benefit from this by becoming more sympathetic and caring when interacting with others online.

In terms of digital culture, people can now do practically anything with their electronic gadgets, including socialize, communicate, browse, and work together. Technology has become ingrained in people's life. The majority of individuals have access to the internet, and academic staff members frequently utilize computers, tablets, and smartphones among other devices to access the web (Spires and Bartlet, 2012). The personnel must constantly be learning new skills to use the ever-evolving technologies. Participating in a global digital culture is becoming the primary attraction of technology more and more. Through the internet, people may establish connections with people anywhere in the world, share content online, and develop a feeling of community.

With the use of internet apps, people can share knowledge globally and become friends with a far wider range of culturally varied individuals. Good communication abilities enable users to handle the complexities of communication that are now a part of the digital world and help them become capable and responsible digital citizens. Creating a healthy social media presence will need awareness of one's digital footprint and polite online conversation (Ozdamar, Ozata & Banar, 2015). There are currently more methods to communicate than ever before because to advancements in communication technology. Although most people can use more modern means of communication with ease, it is still important to understand how to interact online securely and successfully. Additionally, those who access information online need to make sure they know how to stay safe online. The World Wide Web offers learning chances to every individual and a vast and fulfilling source of knowledge and a medium that promotes creativity and imagination.

Online safety refers to a user's ability to recognize possible threats and awareness of their personal security when sharing, browsing, or using the Internet. According to Ojibo (2019), using social networks and media sharing websites like Facebook, Myspace, and YouTube might expose users to unsuitable content and online abuse, among other concerns. The conundrum may lie in how the system should handle online safety and enable users to safely participate in innovative and fruitful social learning using Web technology. When using web technologies for information access and utilization, users must possess the necessary online safety abilities. Digital competency encompasses more than just device and application usage (Ojeniyi & Adetimirin, 2016). It is closely linked to information literacy and the ability to communicate using ICT.

The authors go on to note that responsible and healthful use of ICT necessitates specific knowledge and attitudes about privacy and security, legal and ethical issues, as well as an awareness of the role of ICT in society and a balanced view of technology.

Having functional abilities is essential to becoming digitally literate. Many people feel at ease using technology in this digital age, but as (Barber, 2016) notes, they still need to grasp the fundamentals and develop their independence in order to become more self-sufficient users. Digital content librarians can help users of digital resource platforms develop their functional abilities by letting them experiment with technology and provide assistance when needed. In order to engage with society, users must be able to operate digital technologies, such as computers, smartphones, and other internet-connected gadgets.

2.6.3 Technology Adoption among Academic Staff

In companies that rely on cutting edge information communication technology systems, the insurgency of the digital scene is propelling and producing a wide range of information products and services. Academic institutions and information management companies can now access education and knowledge in virtual environments thanks to technical advancements in digital systems. Digital technology platforms have been developed by higher education and learning institutions worldwide to fulfill and accomplish the objectives of millennium culture and social value.

Teachers in higher education are under pressure to incorporate technology into their lessons due to the exponential development in the use of this tool for learning and teaching.

Even while information communication technologies have significant benefits for teaching in higher education, the need to use them has not always been welcomed with the ease that would have been expected. Technology has brought a range of new information resources into individuals' remote homes and offices while there exists considerable pressure to use it. Information is being accessed, analyzed and communicated faster than ever before. In the current information world, it may not be just enough to have exposure to technology and own a computer, but people need to embrace technology and have the ability to use it. Quadri (2016) notes that in the current technological world, a measure of success depends on how well one can evaluate, manage and communicate all forms of information within a technological environment.

Academic libraries are moving online and out of their physical four walls. Print materials are being replaced by digital and online resources in libraries. The rapid global dissemination of information is made possible by sophisticated communication technologies. As a result, it is widely used and has led to an enormous increase in the amount of information. Information and library workers face new challenges as a result of the expansion of ICT-driven information services (Ansari, 2013). The acceptance of technology use though remains an unbalanced question, whether it is a must do or voluntary. This may be attributed to the attitude towards technology among information seekers.

2.6.4 Attitude towards Use of Digital Resource Platforms

Universities have clearly entered the information era, with students using the internet and relying more on electronic devices to learn and share knowledge (Habib et al., 2020).

According to Ansari et al. (2016), the availability of online learning activities has given teachers and students more options for learning, and they see ICT as a solution for the majority of academic tasks. Nonetheless, academic staff members are hesitant to include integrated technology into their teaching and learning strategies, according to Petterson and Petterson (2017). The authors also assert that students pick up technology faster than faculty members do, which they ascribe to a lack of confidence, an increase in workload, a lack of expertise, a lack of abilities, and an attitude problem. Universities have understood that in order to improve the learning process, they require alternative and technology-driven platforms, even in the face of a lack of resources and readiness.

The growing emphasis in educational policies on the integration of ICT in teaching in pursuit of quality teaching practices to improve student outcomes has brought revolutionary changes in the traditional teaching process (Jumbo, 2019). However, not all academic staff may be willing to embrace the changes, especially the use of digital platforms to access and use information. Uziak et al., (2017) aver that attitude and acceptance of the application of ICT in accessing information is a key factor motivating and affecting the actual utilization of digital resource platforms. In as much as academic staff view digital resource platforms as important in accessing information, the staff finds it expensive (Mulholland and Bates, 2014) in terms of time and finances hence exhibiting poor attitude towards the utilization of digital resource platforms.

2.6.5 Attitude as a Predictor of Use of an Information System

Although attitudes cannot be seen directly, they can be deduced from reactions that demonstrate a certain state or disposition (Mutwiri et al., (2017).

According to research, attitudes are developed through a cognitive learning process in which people gather knowledge before forming beliefs. Experiences with the object—such as the Internet or a specific website—provide the knowledge. Given how frequently academic staff members use the Internet, it is reasonable to presume that they have a wealth of online expertise and have developed opinions about its application in the classroom. It's critical to keep an eye on academic staff perceptions of the Internet as a source of information, particularly with regard to digital resource platforms created to cater to the demands of this technologically savvy age.

Users' attitude towards digital resource platforms greatly contribute to their maximum utilization or underutilization. Urhiewhu (2015) opines that academic staff show poor attitude towards the established digital resource platforms in universities and view developing countries as unable to offer reliable digital information services. Such mind-set may be an impediment to supporting the efforts to better digital resource platforms in higher learning institutions. According to Njagi (2019) users choose to use google scholar and other avenues that technology presents for their information needs despite the universities' efforts in subscribing to rich information databases in digital resource platforms. Furthermore, people like "simple and advanced searching features integrated with content, thus most users prefer to use keyword search when using Google and other internet sources, such as Wikipedia and Amazon," according to Wangai (2018). In addition to keyword search, users can also tag item records with keywords to improve their own retrieval and other users' browsing experiences, especially when searching for things on particular themes based on currency or popularity.

Due to the global connections that come with using online platforms to disseminate research findings, academic staff members have recently expressed interest in these platforms in order to assess their scholarly influence. This may be explained by the fact that, in order to get citations and greater visibility for their research, academic staff members have been increasingly motivated to use online tools for research dissemination in recent years due to changing trend practices and promotion criteria in higher education.

Owan et al. (2020) note, however, that despite the many advantages that innovations in research dissemination have brought about, many academics have a tendency to have stuck to traditional methods and show reluctance to adopt new media in the dissemination of their research findings. Despite the drawbacks associated with conventional methods of sharing research findings, many academics are frequently seen employing them (Wangai, 2018). Even though many academics in developing nations have access to electronic or digital resources, they frequently refuse to use them to their full potential and lack the necessary abilities to do so (Odigwe & Owan, 2020). This issue may be related to the academic community's lack of ICT proficiency. The authors also note how many academic staff members at universities use the internet for research and teaching purposes. According to Mutwiri et al. (2017), academic staff members had a negative attitude toward open access outlets when it came to sharing research findings because they believed that articles published in open access outlets did not receive the same recognition as those published in traditional journals. This has a detrimental impact on the use of digital resource platforms and conveys a bad attitude toward them.

Although the majority of university libraries in developing nations have taken the lead in creating and managing digital resource platforms, user access and usage has remained passive. According to Ratanya (2017), there is a dearth of information regarding the perceptions of users, namely academic staff, regarding the accessibility and usage of these platforms. Additionally, academic libraries face challenges in maintaining active and dynamic digital resource platforms due to a dearth of interest from teachers and scholars. Users may have negative perception of using digital resource platforms pointing information explosion to unmanageable levels, and cite unfriendly policies (which may be attributed to factors including copyright, publishing, quality control issues on other publication), complex ICT technologies involved (Njagi, 2019). The implication thus is that access and effective utilization of digital resource platforms is also dependent on user attitudes towards the system. It is upon such motivation that this study proposes a mechanism for promoting access and utilization of information in digital resource platforms.

Digital literacies are pre-requisite skills for people wishing to access and utilize information digital content. The skills enable users to navigate through the deluge of information with much ease and are able to use the accessed information effectively. Digital literacy skills include finding relevant information, critical thinking, digital culture, functional skills, online safety and communication and netiquette. The fast-changing technologies require that users of digital content fully adopt technology to keep abreast with the technology era. Studies show that technology adoption is slow among academic staff and which may also be related the staffs' attitude towards the use of these platforms. The staff view the digital resource platforms as underdeveloped and that they do not meet

the threshold of offering digital information services hence turn to advanced platforms such as google scholar which present multiple search options.

There is a need to address this issue since it has a negative impact on academic staff members' ability to access and use digital resource platforms, which in turn affects the caliber of their teaching and research output.

2.7 Challenges in Utilization of Information in Digital Resource Platforms

University libraries contribute significantly to the academic operations of their respective institutions by subscribing to digital resource platforms that facilitate the automated usage of an extensive array of information resources. But according to academics like Joy (2016), Anyim (2018), Iroaganachi (2018), Madu, Vandi, Chagwa (2018), Abbas & Song (2020), and David-West (2022), there are internal and external constraints that prevent users of e-content from effectively accessing and using the information available on these platforms.

2.7.1 Internal Factors

These are elements that arise from within the institutions and which limit access and utilization of knowledge in digital contexts. Ringera (2007), Ndakalu (2014), and Omette (2016) state that infrastructure development, user interface design, and the level of digital literacy among information professionals and users are examples of internal variables. The usability and interactivity of digital platforms have an impact on information access and consumption as well (Firozjah, Dizaji & Hafezi, 2019). The quality of the interface and the efficient and effective way in which all of the features are displayed to the user are the primary factors influencing the usability of digital platforms (Blake & Gallimore, 2018).

Although the information on some digital resource platforms is safeguarded, access to them can be difficult. According to Inal (2018), the development team should prioritize the needs of the user over technology, making the user a crucial component of the system.

According to Omah and Urhiewhu (2019), there is a substantial impact of the difficulties with interaction on how people use digital platforms to access information.

Users may experience unreliability or inaccessibility when using digital computer-based systems that react to their activities by displaying text, images, animations, videos, and audio (Lee & Kim, 2021). It is possible for interactive digital media to reject viewer or listener comment, turning them into a passive audience and making it difficult to obtain reliable information (Albertson, 2015). It is the duty of academic libraries to construct spaces and collections that satisfy the requirements of its patrons.

The explosion of information, the increasing demand for information, and the challenges of distance in relation to information access and use in physical libraries led to the development of e-content. Therefore, it is envisaged that digital resource platforms will give users and a diverse population quick access to knowledge (Nakitare et al., 2020).

Nonetheless, research indicates that patrons have difficulties when trying to access and use digital materials at local libraries. Both customers and library employees, who are required to help patrons find information, present certain obstacles. For many users of digital platforms and even library staff, inadequate awareness of information technology poses a wide range of technological obstacles. According to Jabeen, Qinjian, Yihan, Jabeen, and Imran (2017), Niqresh (2019), and Xie, Babu, Lee, Castillo, and Hanlon (2020), not only do library staff members and patrons lack the digital literacy skills necessary for efficient

access to and use of digital resource platforms, but they also lack these abilities. Furthermore, Niqresh (2019) pointed out that library employees who lack the necessary training to handle electronic information have not fully embraced the concept of digital resource platforms and are consequently unable to take advantage of these essential resources. Digital literacy is necessary for using digital content, and both the user and the librarian must possess these abilities; using the resource is impacted when these abilities are lacking (Larson, 2017).

Furthermore, research done in 2017 by Sejane demonstrates that libraries with ineffective ICT infrastructures discourage patrons from using the online documents. Some university libraries don't have enough computers, and some don't even have enough bandwidth to support users (Joy, 2016). Because integrating multimedia into traditional collections is a complicated process, creating effective digital libraries presents obstacles for both current and future technology (Mishra 2016).

Digital material is easily replicated, has less set content, and allows several users to access it simultaneously from a remote location. Resource discovery, the creation of digital collections, and the management of digital libraries may become difficult as a result.

2.7.2 External factors

External influences could be uniform across different platforms and could be outside the control of the institutions. Weather patterns, website hosts, and policies are examples of external factors. Apuke and Iyendo (2018) carried out a study to investigate the variables that affect information access on digital resource platforms. The results of the study demonstrated that infrastructure and technical development are key determinants of the

availability and use of digital resource platforms. Due to the restrictions placed, cultural differences among designers, content suppliers, and users may make it difficult for them to access digital information (Kumar, 2016). The design, availability, and usage of e-content in libraries have remained localized even though it should be universally accessed. Regarding the cross-cultural accessibility of digital content, cultural variety creates a number of concerns (Jabeen, Qinjian, Yihan, Jabeen & Imran, 2017).

Regional and institutional differences exist in the challenges that impact the availability and use of information on digital resource platforms. According to Sejane (2017), Iroaganachi & Izuagbe (2018), Mabweazara (2018), Firozjah, Dizaji & Hafezi (2019), Kumar (2016), Kuny, Quebec, Cleveland (2018), technological advancement, copyright rights/intellectual property protection, lack of skilled workers, and incompatibility between hardware and software are a few of these challenges. Digital resource platform information access is further hampered by hardware and software incompatibilities that result from integrating current technologies with the ICT infrastructure already in place in libraries (Mabweazara, 2018). Hardware and software compatibility refers to parts that share the same characteristics and, for the most part, the same or a comparable design, allowing for component replacement.

It becomes difficult to retrieve digital information from several platforms when hardware and software are incompatible. Information submitted on different websites might not be real, which could jeopardize the information's credibility (Okemwa, 2016). Access to and use of material on digital resource platforms is further restricted by the problem of

copyright and intellectual property. Appropriate recognition and protection of legal rights, including copyright, publicity, privacy, matters of obscenity, and defamation, is a crucial component of e-content (Singeh, Abdullah & Kaur, 2020). Music, artwork, and literary works are all protected by copyright laws (Inal, 2018). Digital resource platforms have obstacles to information access due to copyright rights and intellectual property protection concerns. Certain digital platform material might include security measures that prevent certain users from accessing the data (Handa & Bhatt, 2015).

A number of the platforms lack copyright ownership over the content they host. It is improbable that libraries will ever digitize freely and provide access to the protected content in their holdings (Tutu, 2018; Kamau, 2018). Rather, companies will need to create rights management systems, which enable them to distribute material without infringing on copyright (Bosire, 2021). Usage tracking, user identification and authentication, providing the copyright status of each digital object and any usage restrictions or fees, and managing user transactions by limiting the number of copies that can be accessed, charging users for copies, or avoiding sending the request to a publisher are just a few of the rights management functions (Chemulwo, 2018). This frequently conflicts with the responsibilities of libraries and archives, which are tasked with managing and caring for resources that can be vulnerable to privacy rights or other security requirements (Bakare, 2018). Therefore, the problem of copyright and intellectual property protection may make it more difficult for people to obtain content freely across a variety of digital platforms.

According to Okeji and Mayowa-Adebara (2020), access to information on digital resource platforms is further impeded by the ICT infrastructure. Relational databases that handle a variety of digital forms, full-text search engines for indexing, and fast local and Internet

networks are among the infrastructure's components (Omah & Urhiewhu, 2019). For the purpose of managing digital resources as a whole, web servers, file transfer protocol (FTP) servers, and electronic document management tools are essential (Owolabi et al., 2016). Insufficient technical progress in equipment, structures, and artificial systems could potentially restrict access to knowledge on digital resource platforms (Chavan & Khot, 2019).

Reduced access to information via digital platforms could be attributed in large part to institutions' inadequate infrastructure.

According to Wang (2016), the incoherence in resource planning poses a problem for resource repetition among libraries. Rapidly evolving technologies, obsolescence of technology, insufficient funding, inadequate infrastructure for technology, migration, lack of technical know-how, and degradation of digital media are regarded as significant barriers to accessing digital information on digital platforms (Kumar 2016; Kuny, Quebec, Cleveland, 2018; Madu et al., 2018). The way that digital resource platforms are used or not used can also be influenced by user experience. Emotions, beliefs, preferences, and impressions that arise before, during, and after utilizing digital libraries can be categorized as the user experience in digital resource platforms (Barifah, Landoni & Eddakrouri, 2020). User experience describes how people utilize digital platforms and engage with a system, product, or service (Guchacha, 2019). After interacting with a system, user experience plays a role in determining how a person builds a connection (Khan & Bhatti, 2018). When constructing digital libraries, users are frequently left out of the design cycle, according to a research by Sauro (2016). However, professionals in computer science and human-

computer interaction participate in system design specification, which has an impact on user attitude.

Digital resource platforms are created in response to certain user groups' needs, but they rarely include individuals with previous domain experience, which causes a mismatch between the needs of the users and the platforms (Waithaka, Onyancha & Ngulube, 2018). a study done in 2018 by Madu, Vadu, and Chagwa to look at how user experience affects digital platform access and usage. The kinds of digital resource content and the prerequisites for using the platforms are important elements that impact users' experiences, the authors discovered. The user's attitude toward using digital platforms is significantly influenced by their prior experience with the sorts of digital resource content and the requirements to access the platforms. The term "user experience" refers to all elements of a user's contact with a digital resource platform, including its services and goods (Samrgandi, 2020).

Digital resource platforms should not only facilitate goal achievement, but also offer users enjoyable and meaningful experiences prior to, during, and after use (Jabeen, Qinjian, Yihan, Jabeen & Imran, 2017). Anywhere there is a device with a network connection, people can access information thanks to digital platforms. It is also easier to search, explore and update digital content due to computer automation and because of the increase in the volume of information, solutions on how consumers should access and use the content should be sought (Appleton, 2016).

In this sense, one of the most important components of digital resource platforms is the user interface. According to Agostini, Ferro, and Silvello (2016), the expected and ideal user experiences on these digital platforms should be tailored to the specific demands of the users with little to no restrictions. Users may become more or less inclined to use digital resource platforms to further their education depending on their experiences (Zha, Wang, Yan, Zhang & Zha, 2015). Digital platforms facilitate the distribution and discovery of content across a broad range of disciplines. Hence, university libraries must to quickly embrace a culture that fosters superior research and learning via cutting-edge technology and an appealing user interface (Liu, Su, Akram & Abrar, 2020). According to Samrgandi (2020), academic libraries serve as testing grounds for online spaces, thus they should make an effort to match their offerings with user-friendly experiences. This is an attempt to simplify technological innovations that could discourage people from using them to obtain information (Makokha & Mutisya, 2016). Furthermore, in the majority of cases, these digital resource platforms do not fulfill or materialize the user experience expectations. Even though digital resources are more readily available in academic libraries, a number of obstacles work against users' ability to use digital information resources to fulfill their needs (Khan & Bhatti, 2017). This is due to the fact that consumers are hardly ever asked for their input on the features and functionality of digital libraries (Appleton, 2016). Zhang et al.'s (2017) study found that because users don't have enough experience or room to work and interact, digital libraries don't support users' activities, such as using the system.

Furthermore, certain papers on digital resource platforms have a quality stamp attached to them, making it unavailable to users of digital libraries. This necessitates the possession of advanced information literacy skills (Zhang, Liu & Mathews, 2015). Users' attitudes

toward a system are impacted when it is difficult for them to use, new to them, and does not meet their demands. It also loses its appeal and usability. Users' experiences with the digital resource platforms differ depending on who they utilize. Digital resource platforms are valuable when they are efficient and easy to use, which is dependent on the user interface that they offer.

Users' experiences on digital resource platforms are strongly determined by their usability, which is closely related to accessibility (Okongo, 2014). Therefore, by creating interactive systems that are practical and satisfy user expectations, designers can enhance the user experience (Madu et al., 2018; Veena, 2016). Good design elements must be integrated into interactive systems while taking into account the needs, backgrounds, and experiences of end users in order to create useable and beneficial solutions. According to Rahman and Mohezer (2020), the success of any information system, such a digital library system, depends on how well users interact with the system's capabilities over time. Consequently, in order to guarantee favorable reception and utilization of the digital resource platforms, colleges must design efficient and dependable systems. A machine's interaction with a human, which encompasses everything the user may see and do, is referred to as the user interface. User interface design strives to aid users in achieving their activities quickly and stimulate their experience (Sauro, 2016).

Understanding consumers, the intended use of the information contained therein, and what is technically and logistically possible are all necessary for creating viable digital platforms (Tilley, 2016). When users can simply obtain the information they need and complete their assignments with ease, they are exhibiting a positive user attitude (Xie & Matusiak, 2016). Thus, information managers who oversee digital libraries ought to make sure that their

collections are useful by attending to user needs through needs assessment (Madu, Vadu & Chagwa, 2018). The requirements analysis will make it easier to create collections that precisely address the demands of users.

Engaging users, web designers, and library personnel in order to match user needs with service-providing technological platforms is necessary for academic libraries to meet their aim of effectively delivering content. Academic staff engage in a variety of activities, such as teaching, research and publication, mentorship, and innovation. These activities generate a range of information needs, which the system must address in order to provide these needs (Anuradha, 2017). By improving the construction of a corporate website, users' attitudes on digital resource platforms can also be elevated (Comeaux, 2017). According to Chowdhury (2016), academic libraries rely on their websites as vital platforms that facilitate access to a wide range of information collections. Users' happiness serves as a gauge for the digital purpose, thus information experts and designers must collaborate to understand user demands and provide relevant responses in order for digital services to be more beneficial. When creating user interfaces, users should be the primary priority (Kumar, 2017). Ask users if they think digital library interfaces are user-friendly.

According to Duncker et al. (2020), a substantial resource of digital platforms has been built with a huge number of potential users; yet, there are still difficulties in creating facilities that will enable more thorough access to and use of the expanding body of digital information. These difficulties can be linked to learning new software, the difficulty of teaching a non-expert how the material is organized in a digital library, and the difficulty of understanding the specifics of how information is organized in a library that is unknown to oneself (Anyim, 2018). Whether or not consumers will stick with these libraries depends

on how they feel about digital resource platforms. Thus, designers must work with librarians to develop effective methods for organizing information and employing computers to portray it digitally (Schwartz, 2018). The devices that people use to access information in the digital world have an impact on both the user interface and the overall user experience.

According to a study by Zha et al. (2020), there have been advancements made in the web experience across a variety of mobile devices, which have changed how users access digital information on the web and how interface designers and developers work. The goal of this is to get rid of problems that people run into when they try to access digital material. Nevertheless, according to Appleton (2016), there are still a number of issues that digital libraries must deal with in order to make their services and material accessible on a variety of devices, such as inadequate user experience, poor navigation, and a mismatch between the demands of users and the information offered. Digital resource platforms should incorporate user considerations into their design from a usability standpoint. According to Samrgandi (2020), scientific advancements lead to a growth in the desire to exploit the Internet, and university library websites are regular outlets for data distribution. Universities in particular stand to gain from this by encouraging effective methods of teaching and acquiring knowledge.

To improve the user experience with digital libraries, it is therefore important to evaluate how these systems ensure a positive relationship with users despite technical advancements (Gilbert, 2016; Zha et al., 2020). As a response to the issues raised, the study aimed to offer a framework for encouraging and enhancing access on digital platforms. Research has shown that there are numerous obstacles that users must overcome in order to access

and use content on digital resource platforms. Complex user interfaces, limited infrastructure to facilitate digital content access, and a lack of digital literacy skills to enable staff members to access and use information on these platforms provide obstacles for academic staff members.

Additionally, library employees who are supposed to counsel patrons do not offer professional assistance to academic personnel. This is a result of their inadequate ICT proficiency as well. Additionally, libraries lack the ICT infrastructure necessary to properly facilitate digital information access. Academic staff members encounter difficulties with the visual design as well. This has to do with how the content is organized, how images are used, how color is used, and search capabilities. Further obstacles to the access and use of information in digital resource platforms include incompatibilities between hardware and software, copyright/intellectual property protection, technological advancements, and structural and economic issues. These challenges are why this research is necessary.

2.8 Review of Access and Utilization of Information Frameworks in Digital Information Environments

The digital age has become the focus in the information field and the one determining the effectiveness and efficiency of information service delivery. University libraries have therefore subscribed and also developed digital resource platforms to facilitate fast, wide-range and real-time access to needed information to support teaching, learning, and research activities. However, in as much as these digital resource platforms allows for effective interaction with information spread across networks, literature shows that that the information explosion limits the digital environment discoveries making it challenging for

individuals to access and utilize relevant information (Martin & Leon, 2014; Jimeno-Yebes, Berlanga-Llavori & Rebhlz-Schuhmann, 2010). For this reason, scholars have developed frameworks for access and utilization of information in digital environments.

The frameworks are critical because they provide direction on how users can effectively access and use information in digital resource platforms. They act as a mirror through which users see how to go about accessing the information they need.

2.8.1 An Integrating Information Retrieval Framework

The purpose of the Integrating Information Retrieval Framework (IIRF) is to enhance the digital online environment's accessibility to pertinent information. Zhu, Nammagada, and Reiners (2018), the developers of the IIRF, note that the explosion of information limits users' ability to explore the digital web environment and makes it difficult for them to obtain pertinent knowledge and information using the current retrieval tools, which they believe are inadequately integrated. The development of the IIRF, which uses web search technologies and conventional database searching techniques to provide information retrieval services, ranging from the Internet, intranet, to personal desktop, was motivated by the authors' observation that search results are insufficiently managed to provide an effective information access environment for users.

Figure 2.4 is an illustration of the IIRF framework.

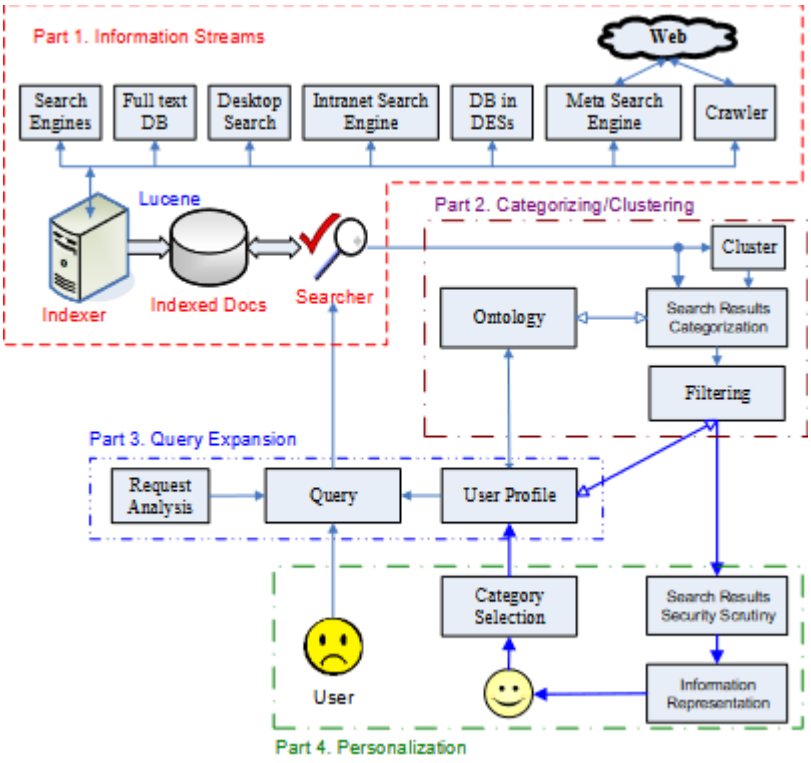


Figure 2.4: Integrating Information Retrieval Framework

Source: Zhu, Nimmagadda & Reiners (2018).

There are four primary parts to the IIRF architecture. The first part is called information streams, and it describes how users' search terms are matched with data from a range of sources, such as intranets, the Internet, full-text databases, databases of digital networks, and desktop computers. By classifying and grouping the comparable and dissimilar objects gathered from various sources, this enables comparison of similarities across search results. IIRF, according to Croft, Metzler, and Strohman (2015), is predicated on the processing power of a single search engine, which may not be able to keep up with the vast rise and nearly infinite amount of data. Additionally, it might be hard for a single search engine to index all of the material on the Web and maintain it current. The authors also note that

while some websites permit their documents to be viewed by search engines, they might not permit external websites to index their content.

The second part is clustering and classifying, which involves grouping itemized data into distinct clusters based on commonalities. The search results are filtered and classified according to the user's selections, then placed under the chosen category for presentation and description. According to Zhu et al. (2018), clustering is intended to group relevant documents together. It may also be used to add new and related index words to a user query and allow the user to browse the results that are retrieved. According to Zhu et al. (2018), the third component is query expansion, wherein the user's profile serves as a reference ontology and each concept has a weight indicating the user's level of interest in that topic. Here, users are prompted to express their level of interest in an existing topic by giving it a weight, and their profile is initialized to ensure that the results accurately fit the interested user.

The fourth element of IIRF is personalization, which involves filtering, representing, and customizing the search results for particular users. According to Zhu and Dreher (2007), search results for IIRF are gathered via desktop searches, full-text databases, intranets, and traditional databases. All of the results are then combined into a single, understandable information representation. The authors also point out that users have the option of selecting which data sources to use in order to obtain the necessary information. By letting users define the search parameters, IIRF gives them flexible access to data sources that meet their information demands. Nevertheless, IIRF ignores the fact that no information system is able to completely satisfy the information demands of its users and instead makes the assumption that all information sources pertinent to those needs are accessible.

The framework also fails to recognize the necessity of features that would attract users for repetitive use such as use of images and color. In addition, the proponents IIRF assumed that all users of the framework are ICT savvy and have adequate knowledge and familiarity with the digital environment and search engines. However, literature (Jabbeen, Yihan, Jabeen & Imran (2017) and Xie et al., (2020) observe that both users and library staff have inadequate ICT skills and are unable to effectively access and use digital resource platforms. Also, users with experience of such advanced information environments are likely not to use the common digital resource platforms in libraries in the developing world because of their capacity in terms of information sources and system support to access information.

2.8.2 Distance Education E-library Model (DEEL)

In 2015, Anne Wambui Kamau created the DEEL model as part of her research on how distant learners could access and utilize information and communication technology at the University of Nairobi and Kenyatta University libraries. The concept was created to enhance distance learners' access to and utilization of information by using ICTs.

Figure 2.5 is a representation of the Distance Education E-Library Model.

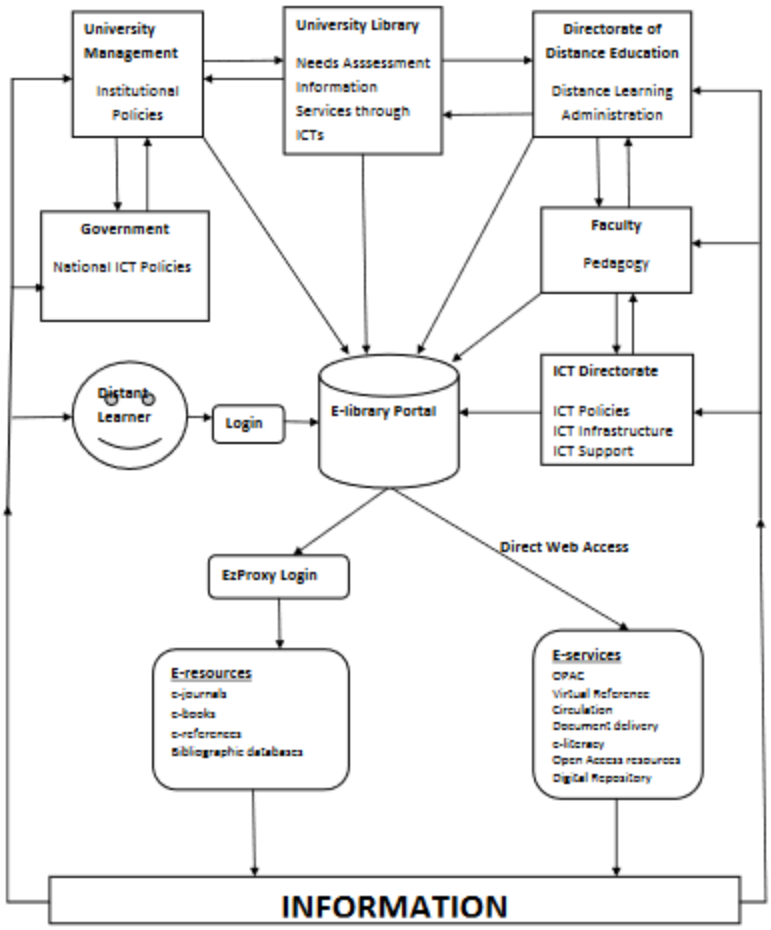


Figure 2.5: Distance Education E-Library Model

Source: Kamau, A. W. (2015)

The framework comprises of four main components including access to ICTs, planning by university management, university libraries and faculty. In the first component, the framework outlines that access to ICTs which are key in accessing and utilizing information should be made a priority for all (both urban and rural) through putting in place the required infrastructures and lowering the costs of access to information though ICTs. In the second component, planning by the university management should include all stakeholders including faculty, and librarians) for expert advice and ensure adequate allocation of resources.

The third component of the framework outlines that the university library should put in place policies that govern access to information and carry out needs assessment studies so as to respond to ascertained needs. A platform that facilitates access to electronic resources and services, a single interface for searching across all resources or federated search, full text and e-journal links from citations, and simple sign-in using known Athens passwords are all things that the library should have (Kamau 2015). Finally, in order to encourage students to use ICTs for information search, faculty members should take on a pedagogical role.

Nevertheless, more emphasis is put on formulation of policies and resources while the framework fails to address the aspect of visual design in digital resource platforms. Literature shows that layout of content, use of images, use of color and search features are important factors in attracting users to access and use digital resource platforms (Kahn & Underwood, 2017; Bowen, 2018; Marsh, 2015). Additionally, the framework minimizes the importance of digital literacy skills as a prerequisite for using ICTs effectively to access and utilize information, even though access to ICTs is essential for doing so in digital environments. It also ignores the issue of adequate information content.

2.8.3 Information Access and Use Model

Daniel Kiprotich Rutto developed the Information Access and Use model in 2011 while conducting research on information access and use. The approach was created to enhance university personnel and students' access to and utilization of information.

The framework has five constructs: user, content, information system, information literacy and outcomes. Figure 2.6 is a representation of the Information Access and Use Model

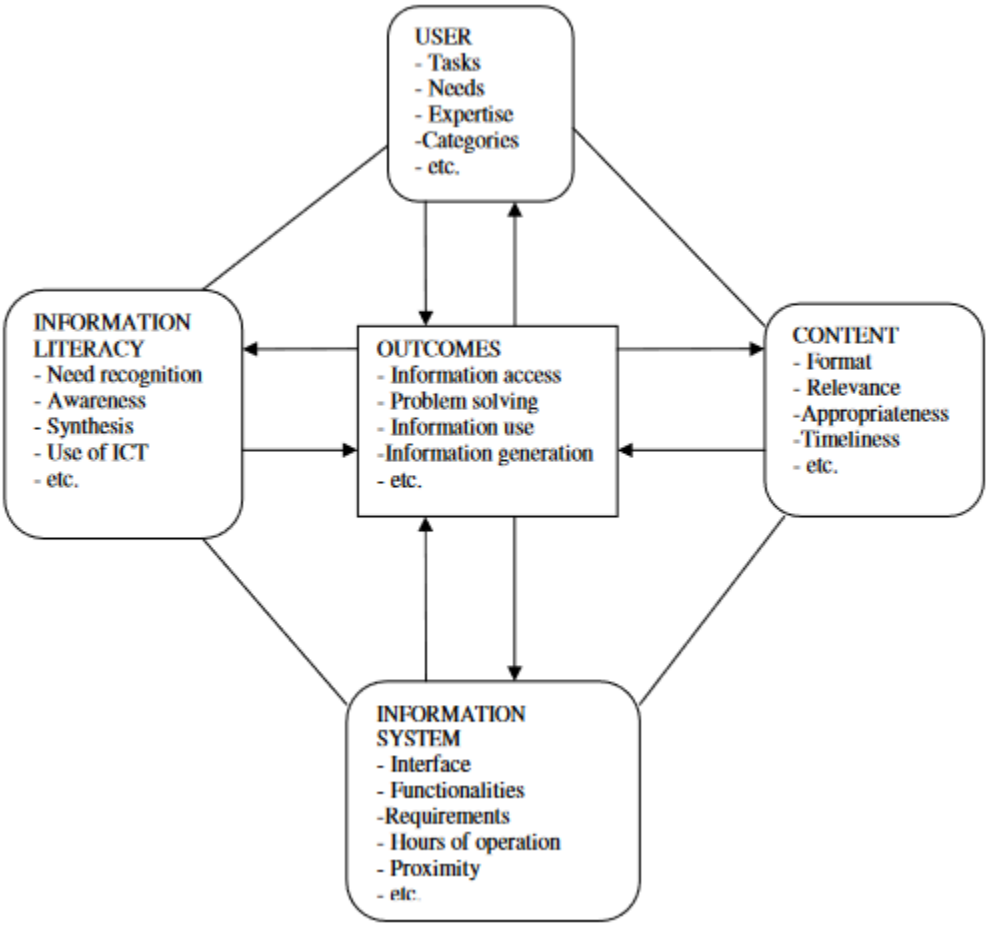


Figure 2.6: Information Access and Use Model.

Source: Rutto, D. K. (2011)

In the framework outcomes of information services are the main focus because they are considered as indicators of the extent to which users are able to access information and utilize it to perform tasks including teaching and publishing of research work. The indicators include information access, information use, problem solving and information

generation which on the other hand are influenced by users' information literacy levels, usability of the information system and content. The framework illustrates that information users have tasks to perform which give rise to information needs. The content to be accessed need to be in formats that are appropriate for users, relevant and current while users need to have information literacy skills so as to be able to use or query the information system.

The system should also have a friendly interface, functional and closer to the users. However, the model does not address the issue of involvement of stakeholders with specific reference to university librarians, librarians in charge of e-content, ICT personnel for their expertise and university management for funding purposes. Also, the model does not demonstrate the necessity for an attractive visual design which plays an important role in bridging the differences of background orientations.

2.8.4 Framework for Improvement of Information Access

In 2014 Dickens Rodrigues Wendo conducted a study on access and use of electronic journals by students at the United States University Nairobi and developed a framework for improvement of information access. The components of the framework include information content, effective network, development of promotional strategies and accessibility guidelines, provision of training, response to specific needs and progress evaluation. The framework put much emphasis on the increase of bandwidth to enable consistent and stable internet availability. The use of virtual private network and building an electronic infrastructure was highlighted in the framework. Table 2.1 is a representation

of the framework for improvement of information access. Table 2.1: Framework for Improvement of Information Access.

Table 2.1: Framework for Improvement of Information Access

Key Areas	Strategies	Responsibility
Information Content	Acquire and make available global peer reviewed e-journals in support of education and research to meet their needs	Team Library
Effective Network	Increase the bandwidth, use of Virtual Private Network - emphasis is on building the electronic infrastructure	Team ICT Team Library
Develop Promotional strategies	Carefully blended mix of promotional tools that integrates and coordinates its many communications channels to deliver a clear, consistent, and compelling message about e-journals.	Team library Public Relations ICT
Develop accessibility guidelines standards	Develop, maintain accessibility standards by looking: what do, user want, level of access	Team library Consortia
	enabling them to provide qualitative services	
Respond to specific needs	Besides taking proactive steps to ensure accessibility, develop procedures for responding quickly to requests	Team library All Stakeholders
Evaluate progress	Establish evaluation criteria and a process. Regularly evaluate the library's progress in reaching accessibility goals. Develop plans for removing access barriers as they are discovered	Team library

Source: Wendo, D. R. (2014)

Nonetheless, infrastructure is only but one of the requirements for facilitating access and utilization of information in digital resource platforms. The users' requirements are central if a system is to be accepted and used. Drawing users' attention to a product requires a lot of effort in the designing of the product and also ease in its usability. Digital resource platforms need a lot of backing with regard to attraction of users. The framework for improvement may not sufficiently promote access and utilization of e-content because it only focused specifically on electronic journals and may not adequately support access to the many other types of e-content hence the need for an all- inclusive framework.

2.8.5 OntoUS Prototype

Antonio Martin and Carlos Leon (2014) created the Onto US prototype in order to enhance knowledge retrieval in digital libraries. The adoption of intelligent strategies to assist users in finding relevant information in the digital environment was suggested by the scholars after they saw that users had difficulties when searching online collections for pertinent material. The researchers observed that the semantic web and artificial intelligence offer a common framework that facilitates the efficient sharing and reuse of knowledge, hence enhancing information access and use. Figure 2.7 is a representation of the Case Base Reasoning cycle in OntoUS.

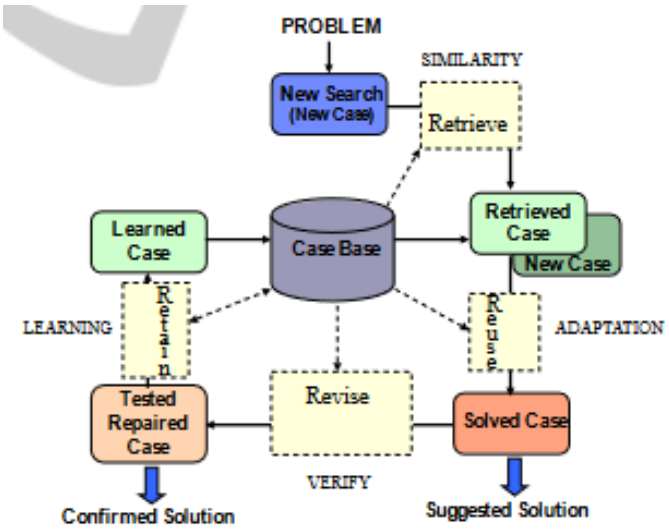


Figure 2.7: Case Base Reasoning Cycle in OntoUS

Source: Martin, A. and Leon, C. (2014)

Based on expert system technology and ontologies, Onto US was created via a Case Based-Reasoning methodology. The process of using Case-Based Reasoning include gathering case and contextual information, creating a proper case representation, determining a precise similarity metric, putting retrieval capabilities into place, and designing user interfaces. According to Martin and Leon (2014), Case-Based Reasoning is a model for addressing problems that relies on reusing information and experience from past similar situations to solve new searches. The concept behind the prototype is centered on information retrieval through the use of domain ontology inclusion and metadata characterizations. It suggests defining intricate, multi-relational case structures using ontology as a vocabulary to aid in Case Based Reasoning procedures (Martin & Leon, 2014).

Independent of data representation, the system gathers a semantic perspective of the world by comparing objects that can be retrieved from various digital resource platforms.

Developers of the Onto US system believe that information about electronic resources in digital resource platforms is processed by the prototype using inference techniques and internal knowledge bases. Metadata components are utilized in OntoUS to provide a representation of digital objects and collections. The Case Base stores the metadata descriptions of the resources and digital resource platforms objects (cases), which are abstracted from the specifics of their physical representation.

Fennie and Sun (2002) claim that because the inference engine has a memory organization interface that presumes the entire case base can be read into memory in order for the Case Based Reasoning to function with it, it contains a Case Based Reasoning component that automatically looks for similar query-answer pairs based on the knowledge that the system extracted from the question text. Furthermore, according to Sun and Finnie (2004), the Case Based Reasoning engine refreshes the query and rankings on the displays by calculating the new case ranking and the answered question using an evaluation function. The retrieval and matching potential of the questions determines their ranking.

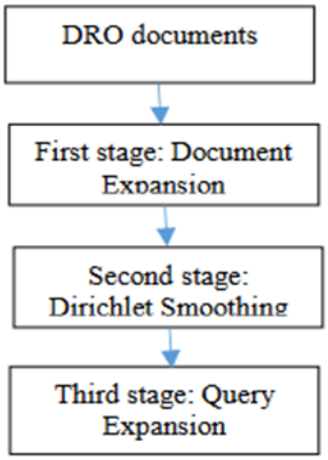
The Onto US prototype features an implemented context interface that enables retrieving cases sufficient to meet a Structured Query Language (SQL) query, and also allows the user to engage with the system to fill in the gaps to return the proper examples. However, due to the lack of an intelligent search frameworks in most e-content information in the commonly available digital resource platforms in universities, users have opted for other easy access and use options. This is because of their flexibility and capacity to conduct off-campus searches enabled by new advancements like tablets and mobile devices that make it possible to access and utilize e-content. Users prefer going to search engines with intelligent search frameworks rather than institutional library resources.

Compared with library OPACs, digital libraries are dynamic recovery systems with the underlying idea that human consumers will be "in the loop" with easy access and use. This necessitates the need to develop a simple and clear framework that suits the local scenario that can facilitate effective access and use of information in digital resource platforms.

2.8.6 Information Retrieval Framework for Digital Resource Objects

The authors of the IRF for DROs are Alma'aitah, Talib, and Osman (2019). The three primary phases of the framework are Query Expansion (QS), Dirichlet Smoothing (DS), and Document Expansion (DE). The idea behind IRF is to improve retrieval performance by maximizing the cooperative efforts of all information retrieval components. IRF resolves DRO retrieval problems and offers an environment for information retrieval with optimal performance, according to Alma'aitah, Talib, and Osman (2019). The digital resource object representation of the Information Retrieval Framework is shown in Table 2.2.

Table 2.2: Information Retrieval Framework for Digital Resource Objects.



Source: Alma'aitah, Talib & Osman (2019).

Dealing with the lack of material in DROs is the focus of the first stage, or DE. The title query was established by the DE technique, which is used in the IRF, to improve the metadata information. The writers go on to say that the titles of articles taken from Wikipedia are utilized as an external resource to offer further information. The second stage aims to enhance the matching between the queries and DRO documents by implementing the DS model as a retrieval model. The DS model, according to the IRF developers, uses small values generated from the probabilistic values of the observed terms to recalculate the unseen terms to zero probability.

The third step provides an example of the QE in the IRF, which focuses on finding a solution to the short query issue in DROs. Alma'aitah, Talib, and Osman (2019) state that the third stage of the procedure gathers all relevant Wikipedia articles, treats each article's title as a word, and estimates the likelihood between the query as a whole and each article's title. After that, all titles with a probability higher than zero are combined into a single set known as the enrichment set, and each query term's similarity inside the enrichment set is determined. However, in as much as the IRF for digital resource objects may yield satisfying search results, the framework fails to address the issue of digital literacy among information providers and users. As well, the framework involves a long process in finding the needed information which is time-consuming and may confuse and discourage users along the way.

2.8.7: Framework for Interactive Video Digital Libraries

The Framework for Interactive Video Digital Libraries (FIVDL) was created by Albertson in 2012. A single set of conceptual discoveries is contained in the two-fold framework. According to the author, the framework's first element shows a generalized user interface that includes interactions between users in various interactive video retrieval scenarios. The supporting interface designs or feature sets that are produced are depicted in the second component. Two figures that comprise the overall framework are used to present the framework. Every illustration influences the other. For instance, user interaction informs the second figure while interface design informs the first. There are particular issues that apply to video, hence the framework is unique to interactive video retrieval. Figure 2.8 and Figure 2.9 are a representation of the framework for interactive video digital libraries.

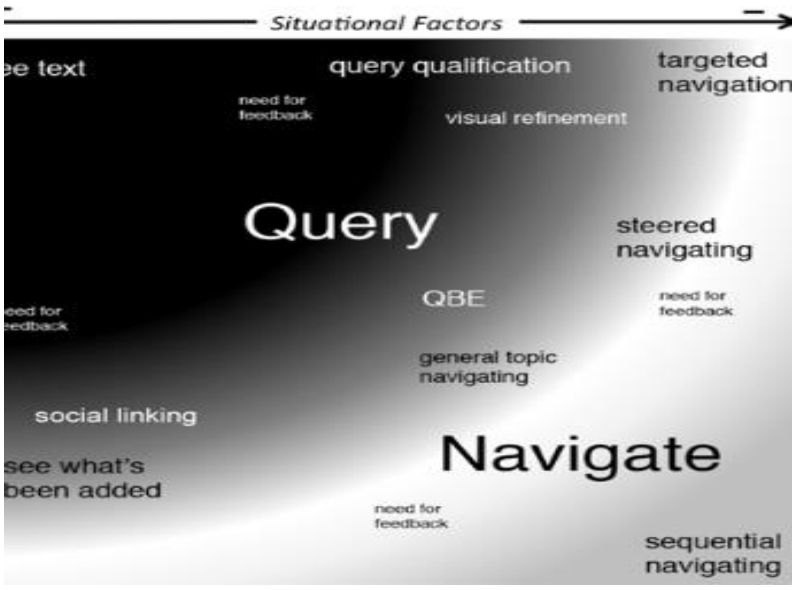


Figure 2.8: Framework for Interactive Video Digital Libraries

Source: Alrbertson, D. (2012)

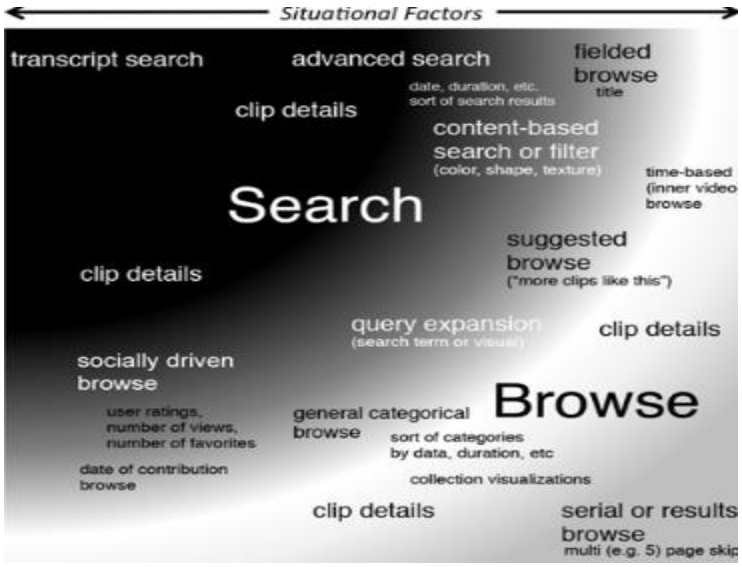


Figure 2.9: Framework for Interactive Video Digital Libraries

Source: Alrbertson, D. (2012)

"Video search," as defined by Arlbertson (2012) in Figure 2.8, is the fundamental situational context of the framework in which users are confronted with a real need for video information and endeavor to meet it through the usage of an interactive video digital library. Users can use both search and browse options, or both, in Figure 2.9 video search to try and find the video-related information they require. Humans are involved in loop one of the interaction relationship between the system and its users. The author further note that the system returns results based on the users queries where users can provide additional feedback so as to reattempt finding relevant information. However, the challenge in this process of retrieving this information requires experience, knowledge and domain affiliation which most users may be lacking.

2.8.8 Document Retrieval Framework Architecture

Ayed, Biski, and Meunier (2011) developed the Document Retrieval Framework Architecture (DRFA). The process of matching some specified user queries against a collection of free-text items is called document retrieval. According to the developers, the framework carries out five steps. The first is called "acquiring crude contents," and it involves gathering used data that is subsequently retrieved by querying. The second phase is the analysis of raw documents, which entails transforming each raw data instance into a predetermined format that can be effectively inferred and output. Data indexing, or mapping each document to a unique key, is the third phase. Then, rather than using the complete contents of the document, the retrieval process is based on a specific key. The process of retrieving top documents, or indexes of the top documents that match the user query, is what happens in the fourth stage. Summarizing a specific retrieved document or a group of the top retrieved documents is the last stage. The architecture of the Document Retrieval Framework is shown in Figure 2.10.

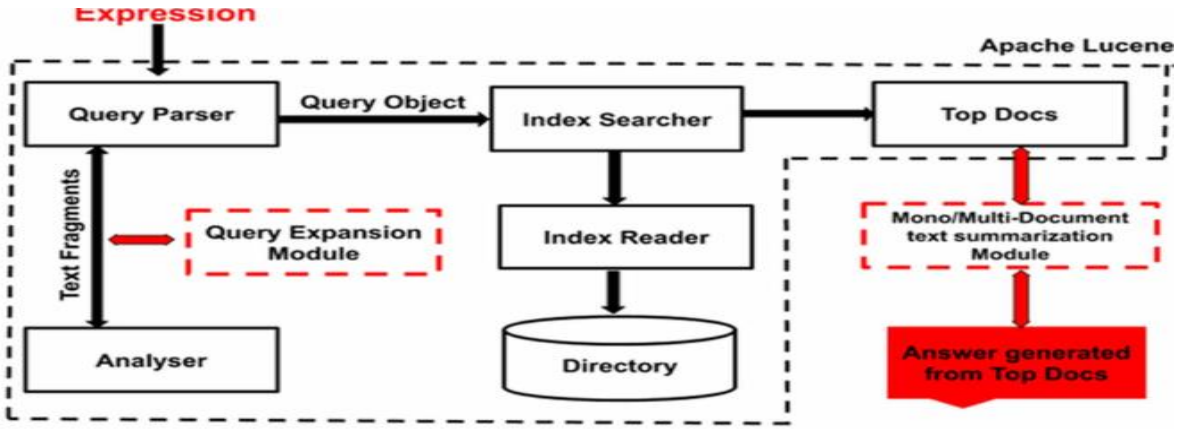


Figure 2.10: Document Retrieval Framework Architecture

Source: Ayed, Biski & Meunier (2011)

The author also notes that the records are indexed after the first, second, and third phases—which are completed offline—allow users to query the specified document retrieval framework. After verbalizing the query, the index database is searched for a match. The user is subsequently presented with feedback in the form of the returned response. Although the document retrieval framework is elaborate, it requires established infrastructure and digital literacy skills which are a challenge in the developing nations. The framework's functionality is also based on a totally digitized information environment which majority of universities in Kenya still offer blended information services. This is because of inadequate facilities that support ICT functionalities.

2.9 Summary of Literature and Research Gaps

The chapter reviewed existing literature in accordance with the study's objectives and talked about the ideas that served as the study's compass. A review of the literature revealed that colleges have set up digital resource platforms to enable quick, simple, and unrestricted access to and use of information. Nevertheless, the user's information needs cannot be met by the kinds of digital resource platforms that are now available. The range of digital resource platforms that university libraries subscribe to has limited the amount of information that can be accessed for teaching and research purposes in universities.

The visual design was also looked at in the study as a crucial element of digital resource platforms. The visual design's relationship to content arrangement, color and picture use, and search functionality were the main points of emphasis. Literature indicates that the visual design should be appealing and user-friendly to attract repetitive visits by users.

However, reviewed literature showed that the design lacks user centeredness and the users' views and expectations are ignored while developing digital resource platforms. This has rendered the digital information resources to be underutilized and hence negating the purpose of digital resource platforms in supporting teaching and research which this research has undertaken to address.

Furthermore, research indicated that in order to effectively access and use information on digital resource platforms, one must possess digital literacy abilities. However, it was shown that insufficient digital literacy abilities prevent academic staff members and library staff members from efficiently accessing and using material on digital resource platforms. Finally, literature on existing frameworks for access and exploitation of information in the digital environment demonstrated that they did not adequately address the issues experienced by users with specific reference to academic staff in institutions in Kenya.

The IIRF is based on an ideal situation of availability of all the needed sources of information that are relevant to the users' needs which is not the case with the thesis problem and also fails to acknowledge that no information system has the capacity to fully meet the users' information needs. The framework also fails to recognize the necessity of features that would attract users for repetitive use such as use of images and color. In addition, the developers of IIRF assumed that all users of the framework are ICT savvy and have adequate knowledge and familiarity with the digital environment and search engines. However, literature reveals that that both users and library staff have inadequate ICT skills and are unable to effectively access and use digital resource platforms.

OntoUS provides an advanced level of information access and due to lack of intelligent search frameworks in most e-content information in the commonly available digital resource platforms in universities, users have opted for other easy access and use options. This makes OntoUS unsuitable for the thesis problem. Equally, framework for interactive video digital libraries requires its users to have experience, knowledge and domain affiliation which most users may be lacking. Also, the Document Retrieval Framework is elaborate, but requires established infrastructure and digital literacy skills which are a challenge in the developing nations including Kenya. The framework's functionality is also based on a totally digitized information environment which majority of university libraries in Kenya are still in the process of automating information services because of inadequate facilities that support ICT functionalities.

The Distance Education E-library framework puts more emphasis on formulation of policies and resources while it fails to address the aspect of visual design in digital platforms. In addition, in as much as access to ICTs is key in accessing and utilizing information in digital environments, the framework downplays the role of digital literacy skills as a pre-requisite for effective use of ICTs to access and utilize information and neither does the framework address the issue of adequacy of information content. Similarly, the framework for Improvement of Access to Information does not sufficiently enhance access and utilization of e-content because it only focuses specifically on electronic journals and may not adequately support access to the many other types of e-content hence the need for a framework that is all- inclusive. Notably, from the reviewed materials the problem of access and utilization of information in digital environments has not been exhaustively solved and this research addressed the issue. The study therefore,

contributes to the bridging of these gaps and to the body of knowledge promoting access and utilization of information in the digital environment by academic staff in universities.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The approach employed to carry out the study is described in this chapter. The study field is covered, along with philosophical viewpoints, methodology, design, population, sampling, data collecting, instrument validity and reliability, data analysis, and ethical considerations.

3.2 Study Area

Four Kenyan state universities—the University of Nairobi, Kenyatta University, Moi University, and Egerton University—that provide Library and Information Sciences (LIS) programs were chosen for the study. The universities were chosen to provide a clear picture of information access and utilization on digital resource platforms because they are among the best universities in Kenya offering online courses and were the first to be established (Commission for University Education, 2019). The study was conducted within the main campuses because the servers of the university libraries are based in the main campuses. Besides, most equipped libraries with modern technology are expected to be those on the main campuses as a result of high student enrolment which results in more programmes being offered. Therefore, conducting the study in the main campuses was considered satisfactory in drawing the precise picture of the digital resource platforms.

3.3 Research Paradigm

The philosophical stance on how information is acquired, methodological decisions, and analytic frameworks that guide research design at every level reinforce the methodological point of this study. The three paradigms of positivism, interpretivism, and pragmatism typically predominate in the study of social science. According to Creswell & Creswell (2018), paradigms—also known as worldviews, epistemologies, and ontologies—are basic sets of beliefs that guide behavior.

The pragmatic paradigm technique was employed in the investigation. According to Feilzer (2010), pragmatism is a deconstructive worldview that supports the use of mixed techniques in research and steers clear of contentious questions about reality and truth in favor of focusing on "what works" as the truth in relation to the research subject being investigated. As a result, the study employed convergent mixed methods, which both made up for any method's shortcomings and allowed the researcher to capitalize on the advantages of both qualitative and quantitative approaches. Additionally, the methodology made it possible to combine qualitative and quantitative research. The idea that multiple stakeholders are involved in the access and use of information on digital resource platforms in universities, necessitating the use of multiple techniques to obtain reliable data, also influenced the adoption of the pragmatic approach. This gave rise to the chance of selecting suitable methods of investigation to tackle the research issues; consequently, sufficient pertinent data was gathered to precisely inform the study's conclusion.

3.4 Research Design

The study employed a descriptive survey approach, which was appropriate for learning about the opinions, attitudes, and beliefs of a group, according to Kothari (2004) and Creswell (2013). Researchers find that descriptive surveys are suitable because they allow them to gather data without changing the variables under investigation and give them the opportunity to examine multiple aspects of a phenomenon simultaneously in its natural setting (Pickard, 2013). The design informed the researcher's methodological selection and final interpretations.

3.4.1 Research Approach

In order to integrate quantitative and qualitative methods, methodologies, and concepts into a single study, the researcher used a convergent mixed method strategy for this investigation. In order to provide deeper and more relevant results than other techniques might, the convergent mixed method approach compiles integrated facts that are backed by data, words, visuals, and narratives (Johnson and Christensen, 2008). The technique approach was suitable for the study since it prevented the inherent flaws in both qualitative and quantitative methodologies.

3.5 Population of the Study

The study, which involved 113 participants, was carried out in four public universities in Kenya. The participants were university librarians, library workers in charge of e-content, and academic staff from schools or departments offering LIS programs. The three departments that comprise Moi University's founded School of Information Science are Information Technology (IT), which employs nine teachers, Publishing and Media Studies

(PMS), which employs 29, and Library, Records, and Information Studies (LR & IS), which employs eleven teachers. Because of the overlap between their fields of expertise and LIS, academic personnel from PMS and IT departments was also involved for study reasons. They also contributed valuable insights on how to encourage access to and use of information found on digital resource platforms.

At the University of Nairobi, the LIS department is administered under the faculty of Arts and Social Sciences and had 6 (six) teaching staff while at Kenyatta University the LIS department is administered under the school of Education with 20 teaching staff. At Egerton University the LIS programme is administered in the faculty of Arts and Social Sciences under the Department of Languages, literature and linguistics and has 11 teaching staff. The study also targeted University librarians and librarians in charge of e-content from the four selected universities. The academic staff from LIS discipline were the key respondents for the study who provided authoritative and reliable information on access and utilization of information in digital resource platforms. This is because besides being users of the digital resource platforms, the staff are involved in training learners in managing information collections and systems that facilitate access to information. The staff therefore richly contributed to the study by sharing their expert knowledge as trainers and personal experiences with digital resource platforms as users.

Librarians in charge of digital content formed the second category of respondents and were useful in providing information about the delivery of information services through digital resource platforms and the functionality of the systems. The third category comprised of university librarians who are part of the universities' top management. The staff are involved in decision- making and policy formulation with specific reference to library and information services through the digital resource platforms in the universities. The staff provided valuable information for the study in regard to access and utilization of information in digital resource platforms.

3.6 Sampling Techniques and Sample Size

When doing empirical research, sampling is the process of choosing a small number of participants from a larger group, especially when it is impractical or impossible to include the full research population in the study (Flick, 2014 & Pickard, 2013). Purposive and census research methods were utilized in this study.

3.6.1 Sampling Techniques

Sampling procedures involve reducing the size of the population to a more manageable number in order to choose a sample. For the study on universities, census sampling was used; for the other three respondent categories, purposeful sampling was employed. The Commission for University Education (2019) carefully chose the four most prestigious and well-established universities in Kenya for online education in order to paint a clear image of information availability and utilization on digital resource platforms. The census sample approach was used since the numbers of respondents for the three categories (LIS academic

staff, university librarians, and library staff responsible for e-content) were manageable to investigate. The three categories were essential for supplying knowledgeable data that would produce reputable and validated conclusions.

3.6.2 Sample Size

A sample is a subset that is selected from a bigger population. According to Fraenkel and Wallen (2000), a sample in research is the smaller group from which conclusions are drawn and then extrapolated to the wider population. Because their numbers were manageable and not excessively huge, academic staff members who teach in the LIS program were chosen by census sampling. Purposeful sampling was used to choose university librarians, library staff members in charge of e-content, and universities from the four participating institutions. Table 3.1 displays the sample size that was used in the study.

Table 3.1: Sample Size

University	University Librarians	Library Staff in Charge of E-Content	Academic Staff	Total
Moi University	1	6	49	**60**
University of Nairobi	1	7	6	**14**
Kenyatta University	1	5	20	**26**
Egerton University	1	5	11	**21**
Total	**4**	**23**	**86**	**113**

3.7 Instruments of Data Collection

Two sets of questions and an interview guide were utilized in the study to gather information from participants. Data was gathered from university librarians using the interview guide, and two sets of questionnaires were given to academic personnel and library staff responsible for e-content.

3.7.1 Questionnaire

Questionnaire presents written questions for an identified group of respondents. Pickard (2013) states that survey data are usually obtained by means of a questionnaire where closed-ended and open-ended questions complement each other in providing comprehensive information. Academic personnel and e-content librarians were surveyed using both closed-ended and open-ended questions as part of the study. In response to open-ended questions, participants voluntarily shared more details that closed-ended questions would not have been able to record. Respondents to closed-ended questions simply indicated their answers on a Likert scale.

Academic personnel and librarians in charge of e-content were surveyed using two sets of questionnaires that included distinct but related questions drawn from the study goals (see appendices II and III, respectively). The questionnaire covered the study objectives: types of digital resource platforms in university libraries; visual design in digital resource platforms, digital literacy among academic staff, challenges faced in accessing and utilizing information and approaches to be adopted to address the challenges.

3.7.2 Interview Guide

The interview guide encompassed several aspects related to the availability and application of information on digital resource platforms, which provided context for the data collected through the questionnaire. The questionnaire may have left holes, which the interview guide filled in. All university librarians taking part in the study were given the same set of pre-planned interview questions in the interview guide. The interview process provided the chance to go deeper into the study by seeking clarifications and supplementary data that further enhanced the research, and the questions precisely addressed the study's objectives. University librarians participated in the semi-structured interviews (see Appendix IV).

3.8 Data Collection Procedures

The study adopted two approaches in collecting data namely questionnaire administration and face to face interviews.

3.8.1 Questionnaire Administration

Academic staff members and e-content librarians completed a self-administered questionnaire for this study. Since the questionnaire has a high response rate and just needs to be delivered to respondents, it was chosen as the method of data collection from the respondents. Anonymity was achievable, first-hand data was obtained, and administering the instrument required less time. Pickard (2013) points out that while respondents are free to share their ideas on the provided research questions, the questionnaires allow respondents to express themselves anonymously and fearlessly. The survey was given to 86 academic staff members and 21 e-content librarians from the four selected universities. It included both closed- and open-ended questions. There were open-ended questions that

allowed respondents to freely provide additional information that would not have been captured in closed-ended questions, and there were Likert scale questions for rating.

3.8.2 Interviewing

Four university librarians were interviewed face-to-face. Punch (2003) notes that interviews give researchers access to people's perspectives, interpretations, and definitions of circumstances as well as their creations of reality. An interview is a face-to-face way of gathering data that involves some questioning and oral communication between the interviewee and the interviewer regarding the necessary information.

The in-person interviews gave the researcher the chance to elicit further details and explanations. As the interviewees spoke, the researcher paid close attention, recorded their responses, and observed their nonverbal cues for use in the data analysis. A phone recorder was used to record the interview proceedings, and a notepad was used to write backup notes in order to ensure correct reporting. Semi-structured face-to-face interviews were employed by the researcher, allowing for the necessary prodding of participants for additional information. Each interview session with university librarians was summarized by the researcher and subjected to a theme analysis.

3.9 Pilot Study

Prior to the start of data collection, the instruments were tested and revised on a smaller sample that was not included in the targeted sample but had characteristics similar to the target population. A smaller sample size from the same demographic as the final study's subjects must be studied, according to Welman and Kruger (2001). Pilot studies help

researchers identify inconsistencies in the methods of measurement, unclear questions and also observe the participants' nonverbal behavior that could have an effect to the study (Babbie, 2016). By checking for any complications in the language used and the content of the questions, as well as any ambiguities in the questions, the pilot study allowed the researcher to determine whether the research instruments were complete and to ensure that the necessary data was collected. It also aided in determining if the information gathered was pertinent to the study questions.

A small sample of academic staff, university librarians with similar characteristics to the actual respondents, and library staff responsible for e-content were pretested using the instruments. Ten faculty members, five e-content librarians, and the university librarian participated in the pre-test at the Technical University of Kenya's Liberal Studies Department. Technical University of Kenya was not among the sampled universities for the study but the staff share similar characteristics hence suitable for the pre-test (refer to Appendix VII; letter of authorization for instrument pre-test).

3.9.1 Validity

Validity is concerned with whether the findings are genuinely about what they appear to be about. According to Guthrie (2010), it describes the degree to which a method or procedures for collecting data accurately measure the desired subject. The study ascertained validity by formulating clear questions for ease of understanding to achieve accurate responses. Also, the researcher adhered to procedures and guidelines for carrying out research. This was through the use of strategies that involved confirmation or triangulation of data from various sources to address

a similar problem, merged unfolding patterns and build explanations during data analysis. The researcher also spend time in the field making observations and used peer reviews review of studies which were affirmed and corrected by the respondents. In the process relating patterns were matched and explanations constructed throughout data analysis that brought out logical conclusions from the indicators to the concept. Similar or divergent explanations were also noted and underscored.

3.9.2 Reliability

Reliability refers to the trustworthiness of the procedure and data generated. Reliability of a study is determined by how well the data collection instrument can be used repeatedly under the same conditions and achieves the same results (Uwe, 2015). It is the level to which a test yields consistent results under invariable conditions in all instances. To verify reliability of the study outcome a pilot study was carried out and data triangulated from various instruments of data collection. The researcher gave a time lapse of four weeks after conducting the first pre-test then repeated with the same respondents. The method of pre-testing was appropriate in determining the reliability of the research instruments. This helped in the identification and removal of items that did not appropriately measure the variables to avoid ambiguity. It also helped in reviewing the research instrument to achieve reliability.

3.10 Methods of Data Analysis

The process of examining and condensing data in order to draw conclusions and extract valuable information is known as data analysis. According to Flick (2017), data analysis is the process of giving the vast amount of information gathered organization, order, and significance. Since data analysis enables researchers to manipulate the information they

have gathered, it is essential to research endeavors as it aids in the conversion of data into knowledge. In mixed methods, it is recommended by Creswell (2013) that quantitative and qualitative data be studied separately. Due to the study's use of a mixed-method approach for data collecting, deductions, interpretations, conclusions, and recommendations were reached through quantitative and qualitative analysis.

3.10.1 Analysis of Quantitative Data

quantitative data analysis used statistical techniques to look at research factors in order to shed light on the data and analyze the traits of the populations under study. Quantitative data was analyzed using the statistical package for the social sciences (SPSS) version 25. Conclusions and inferences were reached using descriptive and inferential statistical methods. By summarizing data on a single variable, descriptive statistics assisted in identifying traits that were common to the entire sample.

3.10.2 Analysis of Qualitative Data

Creswell (2013) observes that the collection of qualitative data, analysis and reporting process are linked and take place concurrently during the study. Interviews elicited words, phrases and concepts which were analyzed thematically. Data collected was analyzed to establish the regularity of occurrence of the chosen content. During interview sessions, the researcher also took notes from the major themes identified. The researcher also through the respondents' consent recorded the interviews which were carefully transcribed to avoid any misrepresentation.

After reading the transcripts, the researcher used the goals and study questions as a guide to find themes that described the respondents' ideas. Using data coding and analysis,

recurrent patterns were found. Coding, according to Kothari (2004), is the process of grouping information before deriving meaning from the group. In general, the coding process was the initial stage of data conceptualization and assisted in organizing the unprocessed data that had been gathered. As a result, a careful and methodical analysis of the material made it easier to identify themes in relation to the study's goals and to develop conclusions.

3.11 Ethical Considerations

Ethics are rules that direct how research is done. According to Guthrie (2010), ethical considerations must be made throughout the research process, including in terms of design, data collection and analytic techniques, and application of study findings. The question of which morally significant problems that researchers' action may bring about in relation to the subjects of their research is addressed by research ethics.

The National Commission for Science, Innovation, and Technology (NACOSTI), Kisii University, and other pertinent authorities were consulted in order to obtain permission to adhere to the rules (see Appendix VI). The Egerton University Research Ethics Committee (REC) was consulted in order to obtain ethical approval for the researcher (see Appendix VII). Egerton University is one of the universities that the Commission for University Education has granted permission to review research ideas and determine whether or not to approve them. Once a proposal has been approved, the research can move on with data collecting. The study obtained authorization from the Vice-Chancellor, Technical University of Kenya where the research instruments were pretested (refer to Appendix VIII). Data collection authorization was also obtained from universities that were involved

in the study namely University of Nairobi, Moi University, Egerton University and Kenyatta University (refer to Appendices IX, X, XI, XII respectively).

The researcher also observed ethics by ensuring anonymity, confidentiality of the respondents for example, coding of university librarians as UL1, UL2, UL 3 and UL4 and participation through informed consent. Taking part According to research ethics principles, researchers must respect and take into account the needs and interests of process participants in order to prevent injuring them. As informed consent is a requirement of ethics, study participants consented to participate based on the information provided by the researcher. The researcher further adhered to copyright rules by acknowledging any borrowed information to guard against intellectual dishonesty and to avoid plagiarism. The plagiarism report is attached to confirm further ethical adherence (see Appendix XIII)

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The results, analysis, and discussions in this chapter are presented in relation to the research problem, objectives, and questions. The four theme categories of digital resource platforms, visual design in digital resource platforms, digital literacy abilities, and difficulties faced while accessing information in digital resource platforms are where the data is arranged and examined.

4.2 Response Rate

The study was conducted in four (4) Kenyan public universities that were chosen for it. Academic staff, university librarians, and library personnel in charge of e-content were among the respondents. As seen in Table 4.1, the response rate was

Table 4.1: Response Rate (N=113)

Subjects	No. of Questionnaires Distributed/Interviews Conducted	Response	Percentage
Academic staff	86	65	76
Library staff in charge of e-content	23	21	91
University librarians	4	4	100

The study targeted 86 academic staff and 65 questionnaires were returned representing a response rate of 65(76%). For librarians in charge of e-content, 21 questionnaires were returned out of 23 questionnaires that were administered which represented a response rate of 21(91%). The high return rate of the questionnaire distributed to academic staff was attainable through several visits to their workstations and through the assistance from heads of departments. However, some academic staff were not able to fill in the questionnaire claiming they had heavy workloads that tied them down. On the other hand, university librarians were instrumental in urging the library staff in charge of e-content to respond to the questionnaire. However, two (2) of them did not fill the questionnaire because they were on leave and could not be accessed. Interviews were conducted with the four (4) university librarians. This was successful due to prior booking of appointments with the

librarians. Babbie (2016) asserts that a response rate of 70% is satisfactory of which the study attained.

4.3 Digital Resource Platforms in Universities

The first objective of the study sought to examine the types of digital resource platforms available in the selected public universities. This was tested through establishing the available types of digital resource platforms, assessing the frequency of access to the specific platforms, establishing the available formats of digital content, assessing specific usability aspects of the digital formats, establish the available types of digital content, and assessing frequency of access to specific types of digital content.

The kinds of digital resource platforms that are available in their libraries were inquired about from the academic personnel. Table 4.2 contains a tabulation of the responses.

Table 4.2: Digital Resource Platforms in Universities (Multiple Responses)

Digital Resource Platforms	Frequency	Percentage
Library Website	64	98
Library OPAC	64	98
Institutional Repository	64	98
Publishers Platform	6	9

Results in Table 4.2 indicate that types of digital resource platforms in the university libraries were mostly Library website, Library OPAC, and Institutional Repository (IR) where all had 64(98%). While there are many types of digital platforms that universities can subscribe to, the three were found to be dominating and more familiar to users in the

universities. This may be attributed to inadequate funding for public university libraries which has affected the scope and regularity of subscriptions to information resources. Notably very few 6(9%) of the respondents identified the publishers' platform as one of the available digital resource platforms. Publishers' platforms may not be very popular among users because it involves costs for libraries to collaborate with publishers so that links to these platforms can be created to enable users access sources not in the library collection. University libraries are key in supporting teaching and learning in higher learning institutions hence they need to be adequately funded. This will ensure adequate information resources for both the academic staff and learners and hence improve the quality of education.

University librarians were also asked about the available types of digital resource platforms in their libraries.

UL1 observed:

We have several types of digital resource platforms, of them being our Institutional repository, library website, Open Journal System (OJS), library OPAC and the Open Educational Resources (OERs).

The finding showed that there were various digital resource platforms for use by academic staff to meet their information needs.

UL2 indicated:

We have about five digital resource platforms, library website, OPAC, Intuitional repository and open Journal System from which users can access information although only three are mostly used.

This implies that users may have preferences of the digital resource platforms to use. It may be attributed to the user-friendliness and ease of navigation.

UL3 said:

We have five active digital resource platforms, the OPAC, Institutional Repository, Library website, OJS and OERs although the OJS and OERs are not so much used.

Users tend to create familiarity with information sources and these brings about preferences and biases against other sources. Information professionals need to market all the resources available so as to create awareness of their availability and usefulness.

UL4 stated:

We have the OPAC, Institutional Repository, Library website, Open Journal System (OJS) and Open Educational Resources (OERs).

While academic staff only indicated four digital resource platforms, university librarians mentioned an additional two: Open Journal System (OJS) and Open Educational Resources (OERs) digital resource platforms. This may be attributed to the fact that users lack awareness of some of the available information resources. Information professionals need

to make known all the information materials held in the collection and this will enhance utilization of the same. The study therefore observed that some of the digital resource platforms available in the libraries were not known to users.

Academic libraries in developing nations have taken the lead in creating and managing institutional repositories, according to Ratanya and Muthee (2019). However, the majority of these libraries haven't raised awareness of the potential advantages and value of these resources among other community members or academic staff. There seems to be little patronage of electronic resources due to limited information regarding the existence of these resources within libraries. Therefore, it is the responsibility of information professionals to guarantee that consumers are aware of the information resources that are available.

University librarians were further asked whether the available digital resource platforms adequately met the academic staff information needs.

The respondents unanimously showed that the digital resource platforms available in universities were not adequate to meet the academic staff needs.

UL1 said:

> *We can hardly meet our users' information needs, but we try the best we can. Library budgets have been drastically reduced making it difficult to subscribe to more digital resource platforms.*

Funding is key if libraries are expected to provide better services to their users. The persistent budget cuts for libraries are detrimental to their service delivery.

UL2 said:

Subscription costs are high and so the library only pays for what it can afford. We are actually unable to adequately meet the needs.

Libraries cannot afford to subscribe a large number of databases while selective subscription limits access to needed information.

UL3 stated:

User demands for information are too high that we cannot satisfy them. Library funding is so limited to even sustain the e-resource subscriptions.

With the current advent of information technology, there is rampant user demands that makes it almost impossible for libraries to meet user needs.

UL4 quipped:

What we have is far from meeting the needs. As we speak now our subscriptions are due and we are unable to pay for renewal. Our users are only accessing the institutional repository so we cannot even think of subscribing to more digital resource platforms.

All the four university librarians indicated that the available digital resource platforms did not adequately provide for the information needs of users. The libraries were also unable to consistently sustain the subscriptions for the existing information platforms and therefore did not foresee the possibility of increasing the number of digital platforms due to inadequate funding. University libraries are experiencing financial constraints that limit them in subscribing to more information resources. Otike and Omboi (2010) opine that university libraries operate in an environment of tightened financial constraints which has affected library operations. The implication is that universities can no longer sustain the demands of spending departments including libraries which entirely depend on parent organizations for funding.

Inadequate funding poses a challenge to information providers in developing collections and services that adequately respond to the information requirements of users (Hartmann, 2011). The findings concur with Thilagavathi and Thirunavukkarasu (2015); Manjunath and Babu (2018) that university libraries suffer from inadequate information materials and services that support learning, teaching, research and innovation in universities and these may compromise the quality of output.

4.3.1 Access and Utilization of Digital Resource Platforms by Academic Staff

Library staff in charge of e-content were asked to rate the frequency of utilization of the available digital resource platforms. The responses are summarized in Table 4.3

Table 4.3: Frequency of Access and Utilization of Information in the Available Digital Resource platforms (N =21)

Digital Resource Platforms	Not at all (1)	Not Freq. (2)	Fairly Freq. (3)	Frequent (4)	Very Freq. (5)	Score	Mean
Library Website	0	1	11	8	1	72	3.42
Library OPAC	0	10	10	1	0	54	2.57
Institutional Repository	0	11	9	1	0	50	2.38
Publishers Platform	14	5	2	0	0	30	1.43

The respondents indicated that academic staff were fairly frequent in accessing and utilizing library website with a mean of 3.42, library OPAC with a mean of 2.57 and institutional repository with a mean of 2.38. Access and utilization of information in digital resource platforms seem to be low. This may be occasioned by lack of user personalization

features while using digital content and which may make the platforms unappealing hence not used very frequently. Satry, Manjunath and Reddy (2011) aver that access and utilization of digital content is greatly affected by the user interface design challenges including information personalization, skill sets and experiences. The establishment of digital resource platforms in libraries was intended to facilitate easy, fast and effective access and utilization of information to support teaching, learning and research activities.

Information professionals therefore need to be aware of the user preferences, abilities in accessing information and continuously review their presentation of information and information systems to suit user requirements. In addition, some respondents indicated that they never utilized the publishers' platform with a mean of 1.43.

The results may be associated with users' familiarity with the three platforms as they relate to findings illustrated in Table 4.2 where most of the academic staff indicated library OPAC, library website and institutional repository as the three most commonly available digital resource platforms.

The library staff in charge of e-content were further asked to explain the reasons for their rating. The staff indicated that the three digital resource platforms were common in most libraries and both users and staff were more conversant with them. Ani, et al. (2016) and Nathaniel, et al. (2021 observe that librarians have inadequate skills to guide library patrons in the use of e- resources and specifically the use of information technologies. This may explain the reason for the users' unfamiliarity with other digital resource platforms available in university libraries and the infrequency of access.

ICTs have brought change in the role of librarians and the staff should now be oriented towards expert guidance to the users for them to ensure effective service delivery. According to Shonhe (2017), librarians need to embrace their position as important participants in the learning process and transition from information providers to educators. In order to address information demands, librarians should act as advocates and entry points for their involvement in educational communities. Users that are more knowledgeable about the information resources that are available will be able to access and utilize digital platforms for information more effectively. Information in these platforms is presented in different formats which may support or hinder access and utilization of information. Ternenge and Kashimana (2019) opine that information users have different preferences when it comes to formats in which digital content is presented because of the different capacities to use.

It was therefore important for this research to establish the available formats of digital content in the digital resource platforms of the selected public universities.

4.3.2 Available Formats of Digital Content

The academic staff were asked to indicate the available formats of digital content in their libraries. Table 4.4 presents a summary of the responses.

Table 4.4: Available Formats of Digital Content (Multiple Responses)

Formats of Digital Content	Frequency	Percentage
Textual	50	77
Audio-Visual	37	57
Video	32	49
Visual	31	48
Audio	27	42
Graphical	19	29

Most 50(77%) of the respondents indicated that textual formats and audio-visual formats 37(57%) were available. Most libraries have large collections of textual formats of information sources. This may be attributed to the user familiarity and their availability. Urhiewhu (2014) observes that textual formats of information sources are easy to use, pocket friendly and present an ease-of-use aspect with regard to user familiarity. Other formats that were available were video formats (32(49%); audio formats 31(48%). Kadir, Johari, and Hussin (2018) opine that other than the cost of acquiring audio-visual, video and visual formats of information sources, they have more additional costs. Users of these formats of information may require secluded areas to listen to the audios or watch the videos unlike the textual formats that can be read even in crowded environments.

Audio formats may also require additional devices including earphones and, or speakers in some environments and even more training for users and library staff which involves cost. This may explain the reasons for university libraries leaning more on stocking/subscribing to information collections that are affordable and this may likely affect access and utilization of information in digital resource platforms.

4.3.3 Usability of the Available Formats of Digital Content

Utilization of the different formats of digital content may be dictated by particular aspects of the content. For this reason, academic staff were asked to assess the formats of digital content on specific usability aspects in their university libraries. The responses are presented in Table 4.5.

Table 4.5: Assessment of Formats of Digital Content on Specific Usability Aspects (N =65)

Formats of Digital Content	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
Graphical content is difficult to interpret	0	3	5	12	45	294	4.52
Textual content is legible to users	0	0	4	34	27	283	4.35
Audio content is not audible enough for users	0	0	5	38	22	277	4.26
Audio-visual content is not audible and clear	0	3	16	18	28	266	4.09
Visual content is displayed in dull colors	0	2	15	29	19	260	4.00

Table 4.5 indicates that the respondents strongly agreed that interpreting graphical content was difficult with a mean of 4.52. Graphics may be difficult for the user's mind to comprehend especially if they are not accompanied with explanations.

Users seek to use various formats of digital content because of the information therein but also get more attracted to sources that are easy to understand (Delany & Bates 2015). Further, the findings showed that respondents agreed that textual content was legible to users with a mean of 4.35. Textual formats have been in use since time immemorial and are easy to use which may explain the reason as to why information users are likely to

prefer them to other sources. Kadli and Kumbar (2013) notes that textual formats create lasting memories in the users' minds where they present ample interaction during use. The findings also showed that respondents agreed that audio content was not audible enough for users at a mean of 4.26. Library users have little time to find and utilize information hence sources of information that present challenges in their use may not attract them. Also, the findings indicated that respondents agreed that audio-visual content was not audible and clear with a mean of 4.09; and that visual content displayed in dull colors with a mean of 4.00.

Effective utilization of any information is greatly influenced by the simplicity and ease of use of content (Gbadamosi, 2012). Unlike textual formats where users have the luxury of re-reading over and over again for understanding video formats may require that a user spends a little more time for replay. Furthermore, users' attraction to various formats of digital content including visual, audio and audio- visual is quality in terms of sound and clarity (Oyeniyi, et al., 2020). With this in mind, information professionals must put into consideration various aspects that meet the users' requirements when acquiring different formats of digital content and which is important for access and utilization of information in digital resource platforms.

4.3.4 Types of Digital Content Available in the Digital Resource Platforms

Information users of digital resource platforms may also have preferences with regard to types of digital content provided and which may influence access and utilization of information. Responding to the question on the available types of e-content in the platforms the university librarians indicated that there were various types of electronic content.

All the four interviewed university librarians narrated that they had collections of electronic journals, E-books, theses, conference proceedings and research publications. The responses showed that university libraries provided various types of digital content which academic staff could utilize for their work. Priyadharshini, Janakiraman and Subradharshini (2015) observe that university libraries provide e-journals, e-books and online databases that academic staff access and utilizes in their researches and preparation for lectures. This may be attributed to the need for current and easily accessible information sources. University libraries should acquire and avail various types of digital content to their users in response to the information needs. The libraries play a central role in supporting academic programmes of the university, research and innovation which can only be realized through adequate information sources.

4.3.5 Frequency of Access and Utilization of Specific Types of Digital Content

Library staff in charge of e-content were asked to explain the frequency of access and use of the types of digital content available in digital resource platforms. The responses are summarized in Table 4.6.

Table 4.6: Frequency of Access and Utilization of Specific Types of Digital Content

(N =21)

Types of Digital Content	Never (1)	Not Freq. (2)	Fairly Freq. (3)	Frequent (4)	Very Freq. (5)	Score	Mean
Electronic journals	0	0	1	16	4	87	4.14
E-Books	0	0	7	10	4	81	3.86
Theses	0	2	10	9	0	70	3.33
Research Publications	0	3	13	2	3	68	3.24
Conference Proceedings	0	5	12	4	0	62	2.95

The findings indicated that the respondents frequently accessed and utilized electronic journals with a mean of 4.14 and e-books with a mean of 3.86. In a rejoinder question, the respondents were asked to explain the reasons for their rating which they attributed to the availability and up-to datedness of the two types of electronic sources. Electronic journals and e-books provide current literature that most users wish to utilize for various reasons. Academic staff needs updated information for teaching, research and innovation which explains the frequency of use. Akussah, Asante and Adu-Sarkodee (2015) agree that academic staff prefers using electronic journals and e- books for research and publishing because they are highly available and provide currently researched literature and are more reliable.

However, some respondents were neutral with accessing and utilizing theses with a mean of 3.33, research publications with a mean of 3.24 and conference proceedings with a mean of 2.95.

This may be attributed to the time lapse between when these information sources are submitted to the examining institution or research institutions and when they are made available for use hence not quite current.

For example, theses have to be submitted to the library for verification of compliance to the institutions guidelines for thesis writing and binding which may take some time because of the high numbers submitted. Research publications and conference proceedings also take time in the process of compiling before publishing and may not be quite current. The rationale for university libraries providing information services through digital resource platforms is to ensure easy, fast and timely access to current literature which should be fulfilled through availing updated literature.

University librarians were also asked to explain the frequency of use to the types of digital content available in the library and explain reasons they may attribute the assessment.

UL1 observed:

> *Most academic staff very often access electronic journals because of their currency and portability since they can easily download, print and refer to them over and over again even when they do not have an electronic device with them.*

Users may prefer using electronic journals because they provide current literature and since they are not bulky users find it easier to download print at a small cost and carry them along for use whenever they wish to refer to them. This may not be easy with theses which are bulky and may involve more cost in downloading and printing and carrying them along can possibly be burdening. A study on the use of electronic resources (Merande, Mwai &

Ogalo, 2021) concurs with these findings that the e-journals were very often used by users in Kenyan universities.

UL 2 stated:

Academic staff frequently access electronic journals and e-books more than other information resources.

This may be attributed to the up to datedness of the resources as a requirement for research and also teaching.

Further, UL3 noted:

> A*cademic staff very frequently access e-books whenever they visit e-resource platforms for their research.*

Academic staff are actively involved in research in different fields of study where they need to use literature. E-books are therefore handy in providing current information and users are also able to access more and related literature from them.

UL 4 pointed out that:

Quite frequently academic staff access e-journals and e-books. Most of the academic staff are busy with research and publishing which demand for current literature.

The digital resource platforms are expected to provide information in preferred formats that meet individual user expectations. The types of digital content in the platforms should appropriately match the information requirements of users. With this in mind, information professionals should consider the user when developing service delivery platforms.

4.4 Visual Design of Digital Resource Platforms

The second goal was to evaluate the digital resource platforms' visual design in the chosen public universities. This was examined by evaluating the information arrangement, picture usage, color scheme, and search capabilities of digital resource platforms.

4.4.1 Layout of Content in the Digital Resource Platforms

Academic staff were asked to explain the layout of content in the digital resource platforms on specific aspects that constitute a good visual design. The responses are summarized in Table 4.7.

Table 4.7: Layout of Content in Digital Resource Platforms (N =65)

Statement on Layout of Content	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
Similar and related items are grouped together	0	8	12	28	17	249	3.83
Images and text are provided to communicate information	27	20	12	6	0	127	1.95
Layout is attractive and enables users interpret messages the design conveys	35	13	10	7	0	119	1.83
Clear paths for navigation are facilitated creating content hierarchies that guide users	36	16	12	1	0	108	1.66
There is good balance between text-to- graphics	38	15	12	0	0	104	1.6

With a mean score of 3.83, Table 4.7 shows that respondents believed that related and similar items were classified together. When related objects are arranged together, it makes it easier to get more information than it would have when they are dispersed separately. According to Sijane (2017), access and use are improved when information pieces are arranged in an ordered manner based on their relatedness. When similar products are arranged side by side, it encourages users to have serendipitous experiences and makes them aware of fresh information that might be helpful for their requirements. This may also be useful to academic staff that wishes to spend little time in searching for relevant information in the digital resource platforms.

However, some respondents disagreed that images and text were provided to communicate needed information when accessing information with a mean of 1.95 and that the layout was attractive and enabled users interpret messages the design conveys with a mean of 1.83. Images create a lasting impression on the users' mind and a sense of identification with particular information documents with regard to re-known authors or publishers. This may influence the frequency of visits to the digital resource platforms to utilize the information. When the layout of the platform is attractive and users are able to interpret messages conveyed then its use becomes easy. The findings show that although university libraries have developed digital resource platforms to enable fast, easy and limitless access to information the layout of these platforms does not effectively support utilization of information by users. Talla et al., (2018) note that poor layout of makes the digital resource platforms unattractive to users.

Furthermore, with a mean score of 1.66, the respondents disagreed that developing content hierarchies that assist consumers promoted obvious paths for navigation. Additionally, they disagreed that the text-to-text graphics, with a mean of 1.6, were well-balanced.

Information retrieval systems that are used to give users the necessary information in a digital setting must also make it easy for users to retrieve the information. Users that follow unclear navigation paths risk getting lost or confused when searching for information, becoming disheartened along the way, and ultimately failing to get the information they require. Also, imbalanced presentation of digital content with regard to text and graphics may create monotony to users accessing such sources and hence make the platform unattractive. The imbalance may be attributed to lack of awareness of the user preferences by information professionals.

4.4.2 Layout of Content by Library Staff in Charge of E-Content (N=21)

Library staff in charge of e-content were asked to indicate whether the layout of content in digital resource platforms facilitate access to information. The responses are summarized in Figure 4.1

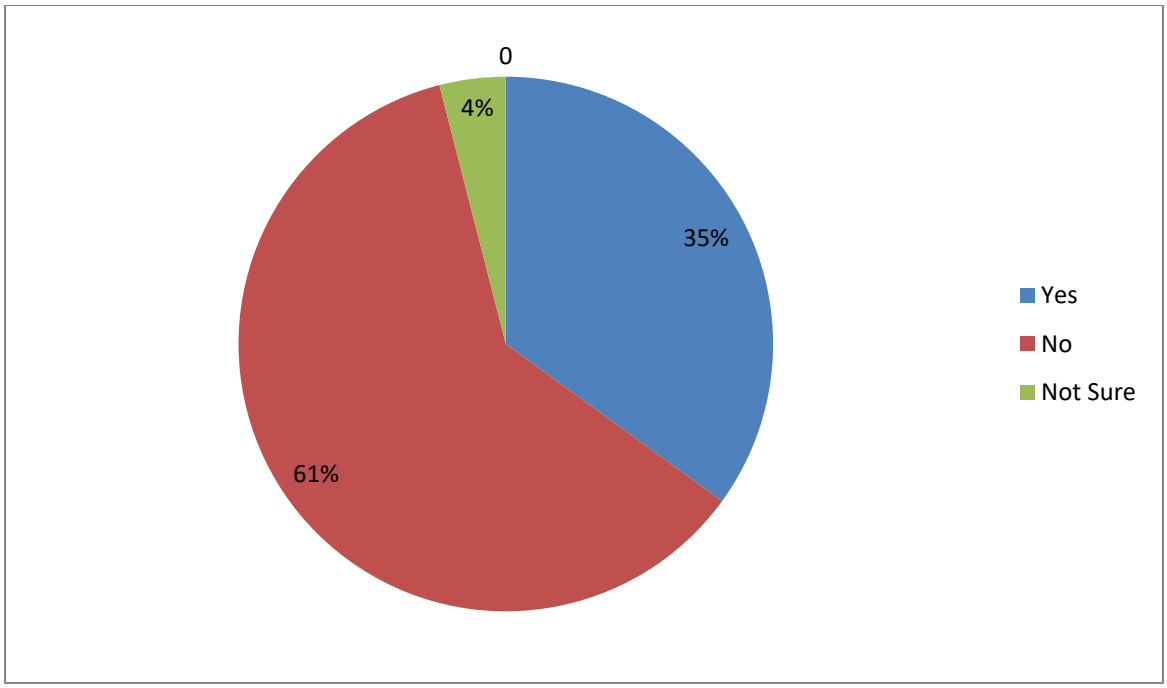


Figure 4.1: Facilitation of Content Layout in Access and Utilization of Information

Responding to the question, majority 14(61%) of the respondents indicated that the layout did not support utilization of information while 8(35%) indicated that the layout supported use because the information was arranged in a systematic order. In a rejoinder question when asked for the reasons why they felt the layout did not facilitate use of information they explained that the platforms were bloated with information making it difficult for users to easily identify the specific information that they needed.

The respondents further explained that e-content is hosted on the university website under the management of the ICT personnel who do not understand the library users' expectations of the information system.

In addition, university librarians were asked to describe how the layout of content in digital resource platforms facilitated access and utilization of information.

UL1 observed:

S*ometimes the library website gets too crowded; you find too much information on the user interface even with obsolete information yet there is very little the library can do and this makes it unappealing to users.*

Information that is organized logically draws in users since it is simple to access, comprehend, and utilize. Users become disoriented and lose track of the content they are interested in on busy websites, and they may give up in the process (Nelsen & Ganter, 2018). In cooperation with the university's ICT director, library staff in charge of e-content should make sure that all of the material on the library website is current and actively remove any that isn't. This may help in dealing with the issue of overcrowding and obsolete information that repulse users who wish to use relevant, current information.

UL2 said:

The content is arranged systematically but the problem is that even old items still crowd the platform.

This demonstrated how infrequently the library website was updated to remove out-of-date materials to make room for new ones. This gave the impression that the platform was badly run, which is why users didn't find it appealing.

UL3 noted that:

In as much as the layout is systematic, some of the content cannot be utilized because it has not been paid for. This makes users feel the website is unnecessarily crowded and disappointing.

UL4 stated:

Although Science Direct, a digital resource portal, provides over forty thousand publications, the library can only subscribe to roughly four thousand titles at a time due

to financial constraints. This is disheartening since customers can see forty thousand titles, but they can only access the forty thousand titles they have a subscription to. Our subscription to ebrary also includes a whole package, many of whose titles are not pertinent to our subscribers' needs. As a result, the content arrangement is cluttered and ugly.

Anything outside of the user needs should be considered noise and should not be included in the library's collection. This explains why library websites are so crammed with unrelated content that doesn't appeal to consumers or are jam-packed with inaccessible stuff, making the layout look unkempt. It is evident that digital resource platforms' content layouts do not adequately facilitate information access.

4.4.3 Use of Images in Digital Resource Platforms

The academic staff were asked to assess the use of images in digital resource platforms. The results are presented in Table 4.8.

Table 4.8: Use of Images in Digital Resource Platforms (N=65)

Statements about Use of Images	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
Relevant images have been used to enhance user experience	32	18	9	5	1	120	1.85
Images have been used effectively to break blocks of text	34	14	12	4	1	119	1.83
Attractive images have been used to enhance repetitive use	36	13	12	4	0	114	1.75
Images of contact persons are included for ease of information identification	35	17	9	4	0	112	1.72

With a mean difference of 1.85 to 1.72, Table 4.8 shows that the respondents disagreed with every statement regarding the use of photographs in digital resource platforms. This suggests that although images are a crucial part of visual design that aids in communication and content identification on digital resource platforms, their use has not been widely accepted. The function of images in digital resource platforms cannot be disregarded because images capture the users' attention because they stick to the mind of individuals fostering repetitive visits. According to Sastry et al. (2011), graphics on websites break up the monotony of lengthy prose, making users' searches and reading more engaging.

University librarians provided a range of answers when asked how images can help users access content on digital resource platforms.

UL1 stated:

We try to incorporate as many images as we can, particularly when digitizing conference papers with author photographs that we submit together with the cover. We have seen a rise in the usage of conference proceedings since we started this.

UL2 said:

Since no staff member has been able to attend training to improve their abilities because university administration has not provided financial support for staff members, the library is now unable to perform such technical exercises.

UL3 pointed out:

No photos have been uploaded by us. To be able to develop a library website with full awareness of users' expectations requires help from the university management. We still have a long way to go, though, as long as the management continues to believe that the ICT team is capable of handling all ICT-related tasks pertaining to the website.

UL4 said:

> *The library is struggling with low budget allocations and the issue of the library e-content being hosted on the university website. We are currently in the process of designing a library website independent of the university one and we hope to consider the use of images and all aspects that will make the library website attractive.*

The results demonstrated that, for a variety of reasons, the usage of photographs in digital resource platforms has not been thoroughly examined. The workers at the library lacked the necessary skills to incorporate images and photos that corresponded with the text.

However, another respondent brought up the point that library staff was not involved in providing anything that could be helpful for information consumption, and that the university administration had given the ICT staff technical control over the operation of the website. On the other hand, one respondent mentioned that people were using the conference papers more effectively since author photos were submitted with them.

An essential component of visual design is the utilization of images that aid in the identification of information. According to Guchacha (2019), the combination of text and images on a webpage increases user acceptance and draws in more visitors who are interested in using the material. This indicates that the content's methodical structure not only makes access easier, but also breaks up the text's monotony. Libraries should be supported to make the visual design of digital platforms as beautiful as possible by expanding the staffs' skills through training so that the staff can give expertise services.

Zhu, Huang and Zijlstra (2019) aver that libraries are core supporters of learning, teaching and research in higher learning institutions and should be well funded, ensure the staff is adequately skilled through continuous training to keep abreast with the changing user expectations. Libraries as non-profit making institutions experience dwindling budgets that may compromise the quality-of-service provision. The responses from the university librarians demonstrate a lack of strong assertion and a hands-on commitment on the part of information professionals in ensuring that user expectations are fully met. It may appear like the staff is not well supported and motivated to pursue some issues concerning the improvement of library service delivery.

4.4.4 Use of Color in Digital Resource Platforms

Academic staff were further asked to give their views on the use of color in digital resource platforms. The responses are presented in Table 4.9.

Table 4.9: Use of Color in Digital Resource Platforms (N =65)

Statements about Use of Color	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
Colors are dull and do not attract frequent use	1	4	13	17	30	266	4.09
Colors used are monotonous and not appealing for repetitive visits	1	7	13	21	23	253	3.89
Colors are well blended to enhance user experience	13	40	5	4	3	139	2.14
Colors used spark interest among users and help in processing and storing images	37	13	11	2	2	114	1.75

According to Table 4.9, with a mean score of 4.09 and a mean score of 3.89, respectively, the respondents believed that the colors on digital resource platforms were boring and did not encourage frequent use. Dull colors tend to bore people since they are more drawn to objects that are visually appealing. Since digital resource platforms act as knowledge hubs, they ought to have user-friendly tones. Furthermore, with a mean score of 1.75, the respondents disagreed that colors were skillfully combined to improve user experience and that colors piqued users' interest and aided in the processing and storing of images.

The findings show that the use of color in digital resource platforms did not meet the doorsill of attractiveness among users.

The colors used in a website are an important factor in drawing users to it and if ignored may cause a dislike of the website by users. Color communicates messages in the human mind and also creates certain feelings about what they see. Mwanzu and Wendo (2017) opine that libraries should consider the psychological effects of color with regard to marketing the library to attract and retain users. The authors further observe that dull colors may subdue excitable behavior, while bright colors stimulate behavior and evoke an inviting image with a sense of efficiency in digital resource platforms. This communicates to information professionals about the need to adopt a fashionable approach to color and materials selection. The use of color seems not to have been given much attention by information professionals which may be attributable to focusing more on information sources without considering other factors that may influence the use or non- use of the information provided.

University librarians were asked to explain the extent to which color had been used to attract users in digital resource platforms.

UL 1 pointed said:

The choice of color is not in our jurisdiction. We just adopt university colors whether they look attractive or not.

Also, UL2 said:

"*Here, it is not a matter of attractive colors. We have no say over the corporate colors."*

The responses indicates that colors were a policy issue and the universities have corporate colors which they identify with and are predominantly used.

UL3 noted:

> *In as much as we may wish to blend with other colors, university colors must be used which may be difficult to please every user's preference.*

The findings show that colors have been used as a matter of policy and that libraries have to adhere to the universities' policies. Bowen (2018) confirms that many academic libraries have limited room to choose colors for their websites because their home university requires them to follow specific color guidelines for branding.

UL 4 retorted:

"It seems colors were chosen when the university was being established and so they are a must do."

It is important to think about whether the majority of stakeholders find the colors that the institutions have chosen appealing. Color draws attention to a space and makes it feel pleasant and stimulating.

4.4.5 Search Features in Digital Resource Platforms

Academic staff members were also requested to evaluate the search functions offered by digital resource platforms. Table 4.10 provides an overview of the replies.

Table 4.10: Assessment of Search Features in Digital Resource Platforms (N =65)

Statements about Search Features	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
Limited keywords and phrases have been provided for searching information	0	1	4	25	35	289	4.45
Users browse the entire website in search of relevant information	2	3	5	22	33	276	4.25
Search features are complicated to understand and use	1	4	9	21	30	270	4.15
Links to publishers and other sources not in the collection has been provided	20	35	3	4	1	120	1.85
Filters have been provided for ease of identification of relevant information	38	18	5	3	1	106	1.63

With a mean score of 4.45, Table 4.10's findings indicate that respondents were in agreement that they were given a restricted set of terms and phrases to help with information seeking. This indicates that there were few options and a limited search area available to consumers of these digital resource platforms. According to Chapman (2018), in order to improve database navigation and maximize the use of information, librarians should offer more links to information. Users may become irritated and give up using information systems that do not offer sufficient keywords and phrases, while others may choose to search for the information through other sources. Librarians also need to maintain consistency in terminologies thus keywords and phrases that describe sources on library guides to avoid confusion among users.

Additionally, respondents (mean of 4.25) concurred that visitors explore the entire website in quest of pertinent information, and (mean of 4.15) thought that search features were difficult to understand. Academic staff members engage in a variety of academic activities

that call on them to employ a broad range of information, such as teaching, research, and innovation. Therefore, in order for the staff to use the information on digital resource platforms successfully, they need to be sufficiently enabled. Finding pertinent information on the website may leave consumers feeling discouraged and frustrated. This could mean that users are not able to find the exact information they are looking for through the search features. As a result, this could have a detrimental effect on the productivity of academic staff members who might not have the luxury of time to devote to information searching due to their demanding teaching schedules and the expectation that they conduct research and publish. Users would need to have access to basic features that are straightforward to use, understand, and locate information without having to browse the full website.

In addition, respondents disagreed that links to publishers and other sources not in the collection were provided with a mean of 1.85 and that filters had been provided for ease of identification of relevant information with a mean of 1.63. Users accessing information in digital resource platforms get frustrated when they are unable to find some information sources indicated as available in the collection and which may be relevant to their needs. The available but inaccessible sources could be because libraries subscribe to specific titles in a database which is presented as a package with access restrictions to specific sources not paid for by the library. Additionally, the presence of filters helps users find pertinent information quickly and efficiently, saving time and contributing to the system's user-friendliness and appeal. Consumers value clear and simple language in resource descriptions that steer clear of technical terms (Sasongko & Hartanto, 2016) to facilitate comprehension and utilization.

To gather more information on search features in digital resource platforms, university librarians were asked to describe the search features in the digital resource platforms with regard to assisting users to utilize relevant information.

UL 1 said:

The search features provided for users seem to be difficult for them to grasp.

When users are unable to understand and use search features then access to information becomes ineffective hence affect productivity or output.

UL 2 observed that:

Users are provided with search features including simple search boxes for quick searches and the Boolean operators that bring together related information sources.

Search features that are interactive and easy to use facilitate easy access to information in the digital environment.

UL 3 remarked that:

> *Boolean operators are handy in facilitating easy access to information. If users could well understand the use of Boolean operators, they could have it easy to access relevant information without wasting much time on searches but it has been a challenge to many users because of lack of understanding in combining the key terms when searching for information.*

This shows that users have a challenge in understanding and using the search features in the digital resource platforms which affects utilization of information.

UL 4 said:

All digital resource platforms provide useful search features but users lack the patience to learn them and use.

A large part of how digital resource platforms convey their credibility as information sources is through the attractive visual layout of the content they provide. As technology develops, online libraries' offerings grow quickly in order to give their patrons access to relevant information. Digital platforms' primary goal is to give users the necessary information in the most practical and enticing way feasible.

E-content is accessed over the Internet, and users come from a variety of socioeconomic, educational, and psychological backgrounds, according to Bader and Lowenthal (2018). Because of this, different users use digital resource platforms in different ways, necessitating the greatest visual design feasible. Rashmi (2020) observes that every design in the digital information environment must be focused on the end user expectations for without which information in digital resource platforms will remain underutilized. Librarians should therefore in this case assert their role by ensuring that they provide relevant, attractive and usable information services through designs that facilitate effective utilization of information.

4.5 Digital Literacy Skills among Academic Staff

The third objective was to assess the adequacy of digital literacy skills among academic staff. This was tested through assessing competencies on specific aspects of digital literacy; using specific digital devices; attendance of training; specific aspects of training; assessing technology adoption and attitude towards digital resource platforms.

4.5.1 Rating Digital Literacy Competencies of Academic Staff

The academic staff were asked about their competencies on specific aspects of digital literacy. The results are presented in Table 4.11.

Table 4.11: Rating Competencies on Specific Digital Literacy Aspects (N =65)

Digital Literacy Competencies	VP (1)	P (2)	F (3)	G (4)	VG (5)	Score	Mean
Finding Information	0	0	9	41	15	266	4.09
Critical Thinking	0	2	15	34	14	255	3.92
Functional Skills	0	5	10	35	15	255	3.92
Online Safety Skills	0	6	22	22	15	241	3.71
Communication and Netiquette	0	4	23	27	11	240	3.69
Digital Culture	0	13	18	23	11	227	3.49

Table 4.11 show that academic staff rated their competencies on all the specific digital literacy aspects as good with mean ranging between 3.49 to 4.09. Basing on the findings, academic staff should experience minimal challenges in utilizing information in digital resource platforms. However, the case is contrary to what is alleged and the staff are unable to navigate through the various databases to find information. Nwofor, Uchenna and Chika, (2018); Joy, (2016) observe that academic staff in universities alleges to be competent in digital literacy but fail to practically exhibit these skills. Similarly, in a study on digital literacy and academic staff (Ahmed, 2021) observe that academic staff are familiar with web-based technologies and engage with the technological tools in their daily lives but lack the confidence to utilize them within their teaching practice. Digital literacy abilities are part of a globalized society in the ICT-oriented environment that is molded by electronic networks and information technology. Therefore, in order to thrive in the academic

environment, academic staff members possessing capabilities in digital literacy skills must practically leverage them.

4.5.2 Competencies in Using Digital Devices by Academic Staff

Additionally, academic staff members were required to attest to their proficiency with particular digital gadgets. Table 4.12 presents the responses.

Table 4.12: Competencies in the Use of Specific Digital Devices (N =65)

Competence in the Use of Digital Devices	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
Using the laptop to access information	0	0	0	29	36	296	4.55
Using smartphone to search and access Information	0	0	6	36	23	277	4.26
Using desktop computer to access information	0	2	5	34	24	275	4.23
Using a tablet to search and access information	14	12	16	21	14	230	3.54

The findings in Table 4.12 show that the respondents strongly agreed that they were competent in using laptops to access information with a mean of 4.55. This may be attributed to most academic staff using laptops in carrying out most of their academic activities including teaching and research presentations. Some respondents agreed that they were competent in using smartphones to search and access information with a mean of 4.26 and using desktop computer to access information with a mean of 4.23. The fast expansion of information technology has altered the lives of many people both at individual level and as groups. Academic staff is compelled to abandon the traditional ways of utilizing

information and adopt the opportunities which the development of information and computer technologies has presented for them. The staff must therefore acquire and practice the necessary skills to exploit the increasing range of digital devices.

According to Alamsyah (2017), using digital devices requires different skills than searching printed materials. These include knowledge of computer operations, database structure, and the instructions that the user must enter into the computer. It also helps to understand how the instructions relate to one another. Also, some respondents were neutral about using tablets to search information with a mean of 3.47. The findings indicate that the academic staff consider themselves as being competent in accessing information. However, according to Ahmed, 2021; Nwofor, Uchenna and Chika, (2018) & Joy, (2016) they argue that the staff do not practically exhibit this competence.

4.5.3 Digital Literacy Training

In addition, academic staff were asked if the library had conducted digital literacy trainings. The responses are tabulated in Figure 4.2.

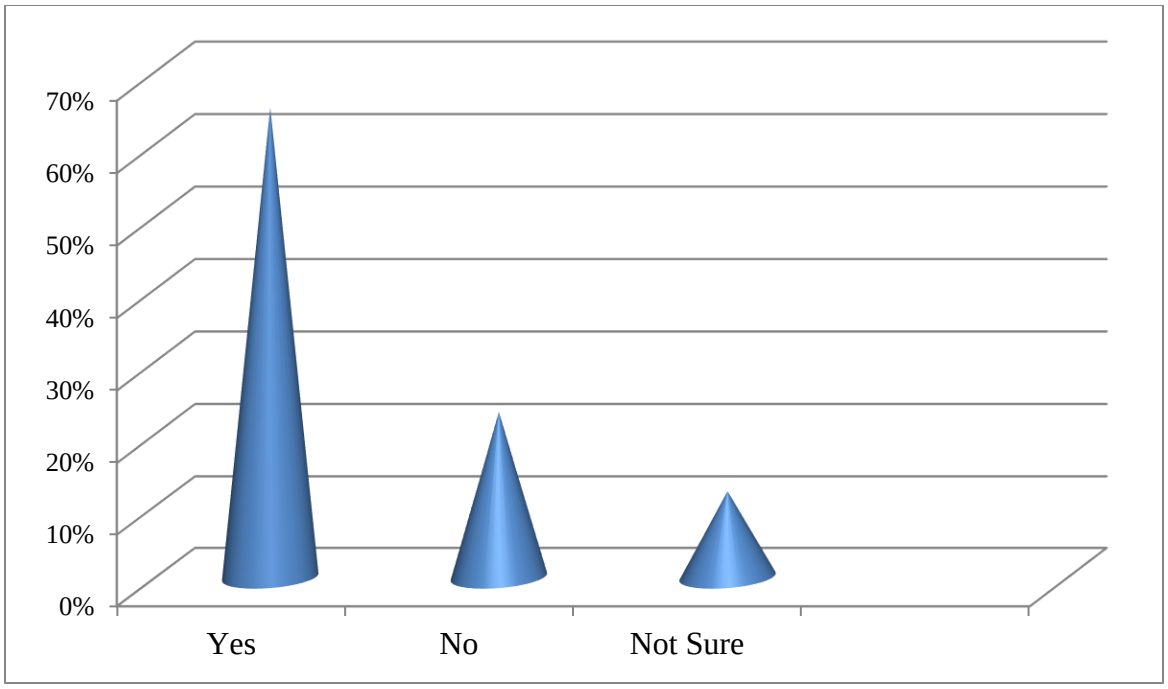


Figure 4.2: Digital Literacy Training

Responding to the question as to whether the library staff had conducted any trainings to equip academic staff with the requisite digital literacy skills, majority 42(65%) of the respondents indicated that the library conducted digital literacy trainings. With the advent of ICTs, digital literacy training is necessary for digital resource platform users to acquire skills that enable them to navigate the digital environment to access the information they needed. David-West (2022) observe that the training is instrumental in making the academic staff to be active users of digital technologies that should be inculcated into the learning environment thus enhancing utilization of information in digital resource platforms.

However, 15(23%) of the respondents indicated that the library had not conducted digital literacy trainings. University libraries play an important role in ensuring that their users utilize the available information resources. To achieve this library must empower their

users to become independent users. However, it may seem that some libraries have not taken up the role with the importance it deserves hence the inability of users to effectively utilize information in digital resource platforms. Information professionals therefore need to take a lead in offering continuous digital literacy skills training to their users.

4.5.4 Frequency of Digital Literacy Training

The academic staff were asked to indicate the frequency of the digital literacy training. Responses are summarized in Table 4.13

Table 4.13: Frequency of Digital Literacy Training (Multiple Responses)

Frequency of Training	Frequency	Percentage
Continuous	18	28
Once in a Semester	14	22
Once in an academic year	13	20
Twice in a Semester	5	7
Non-response	15	23

The findings show that 18(28%) of the respondents indicated that digital literacy training was conducted continuously.

With the rapid changes in technologies in the information environment some university libraries have realized the need for continuous training of their users to update their skills. Continuous training keeps users abreast with technologies and makes them more independent when it comes to finding information.

Some respondents, 14(22%) indicated that the training was offered once in a semester, 13(20%) indicated that the trainings were offered once in an academic year and 5(7%) indicated that the training was conducted twice in a semester. The findings showed varying responses with regard to the frequency of digital literacy training. This shows that each university library had its own schedule on how frequent the training is conducted. The non-response may be attributed to the non-attendance of the training by some academic staff and therefore one may not be aware of how frequent the training was conducted. This is confirmed by university librarians' responses to the question on how they ensure academic staff are adequately equipped with skills that enable them utilize information in digital resource platforms.

The university librarians were asked to explain how the library ensured that academic staff were equipped with skills to help them utilize information in digital resource platforms.

UL 1 said:

"We offer training on how to access e- resources regularly"

Digital literacy training is an important component in digital information service delivery where users learn the skills that help them to navigate the digital resource platforms

UL 2 stated that:

Sometimes we offer training to our users to help them learn how to easily access digital information. However, there is very limited time to do so.

There is need for programmme mangers to allocate time for digital literacy skills lessons which

are necessary in equipping both learners and academic staff with skills for accessing information.

UL3 quipped that:

Although we offer regular digital literacy training to our users, most of the senior academic staff do not attend these training because they don't think library staff have the capacity to train them.

The notion that library staff do not have the capacity to offer training to academic staff is ill-conceived and need to be discarded. This may be the undoing for the academic staff in effectively accessing information in digital environments. Library staff with skills and experience in information service delivery are well versed and useful in assisting users access the information they need.

UL 4 stated:

We occasionally offer digital literacy skills training to our users. However, few of the academic staff attend these trainings and this is the reason why they have problems in finding information on their own.

It is crucial that academic staff members take part in digital literacy training in order to provide them with the necessary abilities to pass on to students in order to promote a smooth teaching and learning process. According to Garcia et al. (2013), the process by which new digital literacy abilities are learned is becoming more and more significant since academic staff members are expected to be digitally literate in addition to making sure that their students are as well.

4.5.5 Aspects of Digital Literacy Training

Academic staff were further asked to indicate the specific aspects of digital literacy skills which they were trained. The responses are summarized in Figure 4.3.

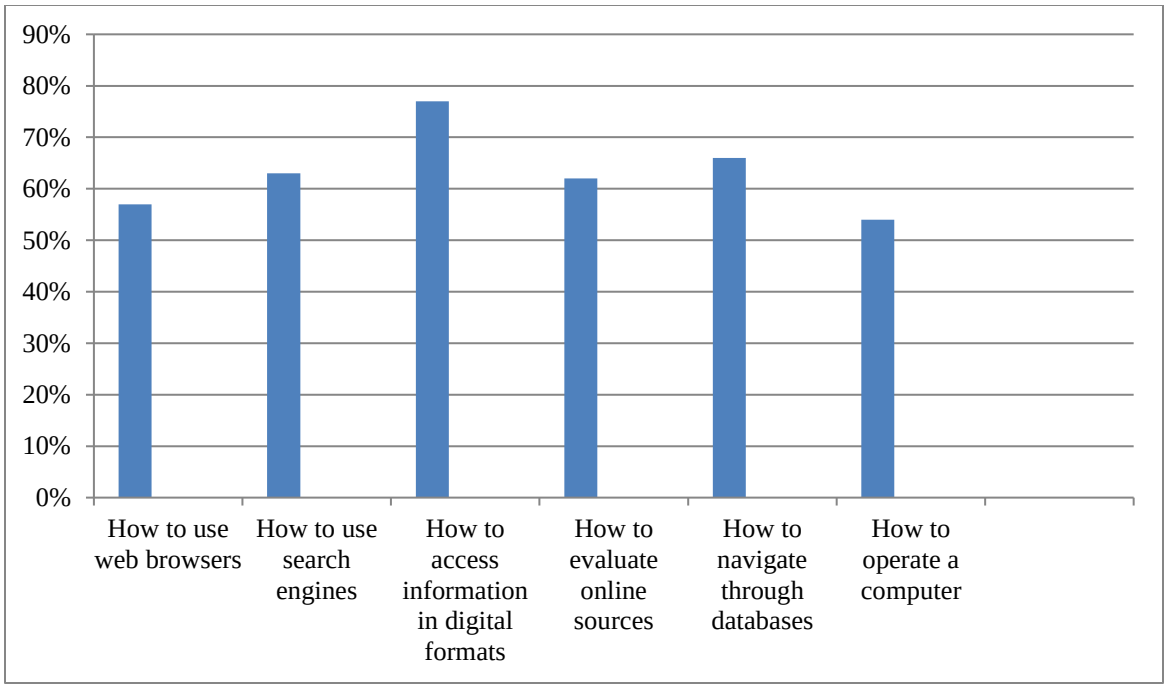


Figure 4.3: Aspects of Digital Literacy Skills Training

Most of the respondents indicated that they were trained on how to access information in digital formats 50(77%); and how to navigate through databases 43(66%). These responses could be associated with a high number of those attended the training when these aspects were being tackled. Sometimes during trainings people move in and out and this may yield different responses.

They also indicated that they were trained on how to use search engines 41(63%), how to evaluate online sources 40(61%), how to use web browsers 36(56%) and how to operate a computer 34(53%). The varying responses give an indication that although library staff offer digital literacy training to their users, there is lack of consistency in attendance among users hence the difference in feedback on the aspects they were trained on. Nevertheless, the overall findings show that academic staff were trained on various aspects that are necessary to enable the staff to utilize information in the digital environment.

4.5.6 Rating the Effectiveness of Digital Literacy Training

Academic staff were asked to rate the effectiveness of the training in digital literacy skills. The responses are summarized in Table 4.14

Table 4.14: Rating the Effectiveness of Digital Literacy Training (N =65)

Training in Specific Areas of Digital Literacy	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
How to operate a computer	1	2	8	21	33	242	3.72
How to navigate through databases	1	11	26	13	14	223	3.43
How to access information in digital formats	1	10	28	13	13	222	3.42
How to use search engines	1	19	20	11	14	213	3.28
How to Use web browsers	3	22	15	14	11	203	3.12
How to evaluate online sources	5	25	15	12	8	188	2.89

Table 4.14 indicates that respondents agreed that the training on how to operate a computer was effective. However, the respondents were not sure about the effectiveness in all other aspects that they trained. While all digital literacy skills are equally important for users of digital resource platforms to help them effectively utilize digital content, the findings show that users were largely uncertain about the effectiveness of the training in most aspects. This may be attributed to the duration within which the trainings are conducted and the complexity of the areas of training and the inadequate capacity by librarians in offering digital training. Joy, (2016); Veena, (2016); Emiri, (2017) observe that digital literacy among library staff is low hence they lack the capacity to guide users effectively. Consequently, Ani et al., (2016) recommends that library staff need to update their digital skills continuously to enhance their skills in the digital information service delivery.

This will help the staff to gain competence to be able to offer training and guide users in utilizing information in digital resource platforms. The value of digital resource platforms is much appreciated if the information users are equipped with the necessary skills to utilize information to answer their information needs.

In addition, library staff in charge of e-content were asked to rate the academic staff competencies on specific digital literacy aspects. The responses are presented in Table 4.15.

Table 4.15: Rating Academic Staff Competencies in Specific DL Abilities (N =21)

Competencies in Specific DL Activities	V. Low (1)	Low (2)	Moderate (3)	High (4)	V.High (5)	Score	Mean
Ability to use social media and share information	0	0	15	6	0	75	3.57
Ability to search various databases	2	11	6	2	0	50	2.38
Ability to download e-books for teaching and research.	2	10	9	0	0	49	2.33
Ability to download and edit photos	12	9	0	0	0	30	1.43
Ability to upload videos and edit	13	8	0	0	0	29	1.38

The findings indicate that respondents rated the academic staff ability to use various social media and share information as high with a mean of 3.57. Most people have adopted social media as the current fastest and most reliable means of communication which may be

attributed to its real-time feedback and affordability. The respondents also indicated that the academic staff competencies in searching various databases and downloading e-books for teaching and research were moderate with a mean of 2.38 and 2.33 respectively.

Academic staff requires a lot of information for teaching, research (publishing). This requires high abilities in searching for information from a range of sources. Moderate competencies may compromise the staff output and fail to compare with other scholars. In addition, the academic staff ability to download and edit photos and upload videos and edit were rated as very low. As seen in 4.13, this might be related to a lack of intensive instruction in digital literacy abilities. Staff members at libraries continue to play a crucial role in assisting users in the digital world where they have access to a multitude of learning resources.

Erstad, Eickelmann, and Eichhorn (2015) note that it can be a serious problem if the lecturers have inadequate competencies in managing digital resources in the learning process. For example, academic staff who are not able to upload videos and edit or download and edit photos for purposes of teaching especially in the e-learning environment may not deliver because these requires them to prepare digital content. According to Alamsyah (2017), professors are not equipped to carry out tasks involving the use of information and communication technology. This could be linked to staff members' lack of experience with digital technologies and their limited understanding of how to utilize ICTs didactically, which could result in a number of issues preventing them from using technology appropriately.

Further, library staff in charge of e-content were asked to assess the overall academic staff digital literacy competencies. The responses are tabulated in Table 4.16.

Table 4.16: Rating Overall Digital Literacy Competencies among Academic Staff

Responses	Frequency	Percentage
Very Poor	0	0
Poor	16	76
Average	3	14
Good	2	10
Very Good	0	0

Findings in Table 4.16 show that majority 16(76%) of the respondents rated the overall digital literacy competencies of academic staff as poor. The findings are in contrast with the academic staff rating of themselves as indicated in Table 4.11. However, the rating by library staff in charge of e-content confirms the findings by Nwofor, Uchenna and Chika, (2018); Joy, (2016) that academic staff alleges to be digital literate but cannot demonstrate the same practically. This is also confirmed by Omette (2016) who observes that academic staff lacks proper skills for searching for information and which is detrimental to utilizing relevant information in their work. Equally, Maina et. al., (2017) aver that university libraries spend colossal amounts of money on subscriptions to electronic resources that are extensively underutilized due to inadequate digital literacy skills that facilitate utilization of these resources. This has a negative effect in the quality of delivery in teaching and research activities. Consequently, it is therefore imperative for both library staff and academic staff to realize the necessity to possess digital literacy competencies to facilitate effective utilization of information in digital resource platforms. Besides, academic staff

must also have the willingness to use or adopt technology so as to make use of digital resource platforms as their sources of information. For this reason, the researcher also inquired about the staffs' technology adoption.

Academic staff were asked to rate their technology adoption. The responses are presented in Table 4.17.

4.5.7 Technology Adoption among Academic Staff

Table 4.17: Academic Staff Technology Adoption (N=65)

Assessment of Technology Adoption	SD (1)	D (2)	N (3)	A (4)	SA (5)	Score	Mean
I am slowly embracing technology in utilizing information	0	5	8	25	27	269	4.14
Technology has increased the cost of utilizing information	0	5	9	27	24	265	4.07
I find technology difficult to use	0	1	14	31	19	263	4.05
I prefer traditional information access methods	14	15	24	7	5	169	2.60
I have no time to learn how to use new Technology	22	11	19	8	5	158	2.48
I find technology useful in my work	3	30	32	0	0	159	2.45
Technology has enabled me to accomplish tasks faster	2	36	27	0	0	155	2.38

Table 4.17 indicates that respondents agreed that they were slowly embracing technology in utilizing of information with a mean of 4.14, and that technology had increased the cost of utilizing information with a mean of 4.07. Academic staff are gradually accepting the use of technology in academic activities including the administration of lectures, class presentations. This has enabled academic staff to defeat the problem of distance and time and can work with minimum strain through the use of technology.

Makori and Mauti (2016) note that universities have adopted information communication technology systems that facilitates and provides favourable environments for utilizing information resources. Cost can be a hindrance to information utilization especially if a user has to use his/her money to purchase bundles to connect to the Internet. In some instances, users have to travel some distance to access the Internet and this involves costs which may influence the adoption of technology. Some respondents were not sure about preference for traditional methods of utilizing information with a mean of 2.60. Traditional methods have been in use for a long time and most information users have held to the traditional methods with some attachment of interacting physically with information sources. This may explain the slow adoption of technology in information utilization that detaches users from the physical experience with sources of information.

However, some respondents disagreed that technology was useful in their work with a mean of 2.45 and that technology had enabled them improve the speed of accomplishing tasks with a mean of 2.38. The use of technology has helped information users to quickly access the information they need in real-time and are able to utilize it for teaching and

research and academic tasks. Users can also make informed decisions and implement them based on current information.

The revolution of technology has created the concept of global village where distance is no longer a hindrance in accessing the desired information in real-time to complete tasks. Nevertheless, some people find technology a challenge to adopt and are still struggling with the use of technology in their work which may be attributed to attitude or the cost involved. Garcia et al., (2016) note that academic staff are less confident in using digital technologies within teaching sessions and they appear to be the least comfortable with learning new technologies quickly.

To gather more information on technology adoption, university librarians were asked to give their views on technology adoption among academic staff.

All the four (4) university librarians agreed that academic staff were at least adopting the use of technology but at a slow pace.

UL1 said:

> *To some it is by compulsion to use the technology especially during Covid19 when they had to access the library and teach online. Although, some have stuck to traditional access to printed books and so we offer both.*

Technology has come in handy for offering lectures online when it is not possible for a physical meet. This was evident during covid19 when learning was to be conducted through the use of technology hence most individuals who were not savvy had no choice but adopt to the situation.

UL 2 quipped:

We have a professor in this university who doesn't even own a cellphone. He literary comes to the library with his note book to find textbooks to read and make notes for teaching. So, in as much as the staff are adopting technology, it is very slow.

This is an example of how technology is being adopted at a slow pace regardless of the level of education. However, it should be appreciated that progress is being made to embrace the use of technology.

UL 3 said:

The staff have no choice and they are embracing technology slowly.

The use of technology is taking root in every sphere of life and in academics particularly it cannot be wished away. Universities are offering distance learning to students who are unable to find time for attending physical classes. For example, those in employment and live far from institutions offering courses of their choice should access learning courtesy of technology.

UL4 observed that:

The younger academic staff are adopting technology very fast unlike the older professors.

The findings showed that technology adoption among academic staff was slow and to some it was by compulsion because of work circumstances where the staff could not have physical lectures with students. A respondent pointed out that some senior academicians had never embraced technology at all. This may be attributed to the intricacies involved in learning new technologies and the cost involved in terms of time and money to purchase bundles and equipment. However, the findings showed that the younger academicians had fast adopted technology.

In order to fulfill their purpose, academic staff members must incorporate new media and information communication technology into their facilities and move beyond the conventional methods of using information for instruction. In higher education institutions, libraries are essential because they offer resources and services that enhance research, teaching, and learning. The use of ICTs into library operations has boosted the provision of library services. Bhatt, Roock and Adams (2016) observe that most developed countries have fully adopted the use of ICTs for carrying out library operations; however, some libraries in developing countries are still in the process of automation. The issues of confidence may appear to be important when considering the manner in which technology is likely to be adopted hence the need for continuous training and practice. Also, the way individuals perceive things may hinder or affect acceptance of their usefulness and for this reason the research further sought to assess the academic staff mind-set about digital resource platforms in their universities.

4.5.8 Academic Staff Attitude towards Digital Resource Platforms

Academic staff were asked to indicate their opinion of digital resource platforms in their university libraries. The results are summarized in Table 4.18

Table 4.18: Academic Staff Attitude towards Digital Resource Platforms (N =65)

Academic Staff Opinion of DRPs	**SD (1)**	**D (2)**	**N (3)**	**A (4)**	**SA (5)**	**Score**	**Mean**
DRPs in public universities are underdeveloped	4	1	6	27	27	267	4.11

DRPs in public universities are poorly designed	3	5	10	41	6	237	3.65
Accessing information in DRPs is complicated	5	4	10	39	7	234	3.60
Finding information in DRPs is time consuming	7	3	17	32	6	222	3.42
DRPs are for the younger generation	40	3	5	10	7	136	2.09

Table 4.18 show that respondents agreed that digital resource platforms in public universities were underdeveloped with a mean of 4.11. The findings imply that the academic staff views the digital resource platforms as being below the expected standards. In the opinion of Maican (2019) the extent to which academic staff view institutional digital resource platforms, accept and use them depend directly on personal variables, including technology anxiety and self-efficacy. Academic staff who may be exposed and have used other digital resource platforms in more developed countries will comparatively find the available platforms not comparing well with what they have experienced elsewhere.

The respondents also agreed that the platforms are poorly designed with a mean of 3.65. This may be attributed to the fact that librarians are not involved in the process of designing library websites instead it is left to the ICT staff who may not necessarily focus on the user needs. The design of digital resource platforms plays an important role in attracting users. Poorly designed platforms receive poor attention from users hence the need to focus on user preferences when in the designing stage.

Some respondents agreed that finding information in digital resource platforms were complicated with a mean of 3.62. Users need to be equipped with skills to enable them and utilize information effectively. The users experience may be attributed to some of them failing to attend digital literacy training and also the non-effectiveness of the training. However, some respondents disagreed that digital resource platforms were for the younger generation with a mean of 2.09. This implies that there is appreciation that digital resource platforms are useful to all ages.

Responding to the question on the extent of involvement by university librarians in the development of digital resource platforms so as to take care of the user requirements which are majorly known to the librarian, all the four (4) university librarians said they were not involved.

UL 1 said:

When it comes to matters that are concerned with digital issues we are not consulted.

This is be a misconception that matters that relate to digital can only be handled by Information communication technology. This notion may serve as the undoing for the effectiveness in offering digital information services in university libraries.

UL 2 stated:

It is the ICT personnel who handle these issues and we librarians are not involved.

There is need to draw the line between what should be handled by ICT personnel and the library staff particularly with regard to information services since librarians have better understanding of the user needs. This will help enhance the uptake of digital information services in libraries.

UL3 noted:

The university management believes that anything to do with technology is for the ICT personnel and since we are hosted by the university website, we are not hands-on, nor are we consulted on how we would like the design to be like and this is where we miss out on user focus.

The notion that librarians do not have the capacity to handle technology issues is ill-founded and has affected service delivery in libraries. This is because the decisions arrived at do not sell well when it comes to information packaging and services.

UL 4 observed:

There is so much bias towards ICT personnel when it comes to digital issues and we no longer fight because no one listens.

Overall, there is poor impression that librarians are unable to deal with ICT issues in their own field. This kind of attitude demeans the effort librarians put in as information professionals which may adversely affect digital information service delivery.

The academic staff also indicated that finding information in digital resource platforms was complicated and time consuming. This may be attributed to their inadequacy in digital literacy skills which results into developing a negative attitude towards the platforms. Nascimbeni (2018) avers that LIS educators also find it difficult to access and utilize information in the digital environment and may develop an attitude that does not support the venture. Further, developing countries including Kenya experience difficulties in putting their little resources into building digital resources which also hamper the establishment of the best practices that would facilitate information utilization as may be expected. Accessing and utilization of information in digital resource platforms has elicited varying reactions in the way libraries deliver information services. With many applauding

the new venture and trying to catch up even with difficulties, as well many may not be receptive of the changing information environment and remain reluctant to accept the reality.

4.6 Challenges Experienced in Accessing and Utilizing Information in Digital Resource Platforms

The three groups of respondents were tasked to list the obstacles to information access and use on digital resource platforms as well as recommended solutions.

4.6.1 Challenges Expressed by the Academic Staff

Academic staff members were questioned about any difficulties they had using digital resource platforms to acquire and use information. Every member of the academic staff stated that they had different difficulties. Table 4.19 presents a summary of the specific challenges expressed by the staff.

Table 4.19 Challenges Expressed by Academic Staff (Multiple Responses)

Challenges	Frequency	Percentage
Technological Dynamism	50	77
Inadequate Technical Skills	45	69
Limited Access Links	40	62
Inaccessible Resources	36	55
Unattractive design	32	49
Limited Digital Resource Platforms	30	46
Un-updated Library Websites	22	34
Sophisticated Search Features	19	29
Inadequate Guidance from library Staff	17	26

Table 4.19 shows that respondents expressed various challenges that they face in accessing and utilizing information in digital resource platforms. Respondents indicated that the main challenges were technological dynamism 50(77%), inadequate technical skills 45(69%), limited access skills 40(62%) and inaccessible resources 36(55%). The fast-changing technologies possess a challenge to most information seekers in the digital environment. This requires continuous training on how to use new technologies for both information users and information professionals (library staff) to keep abreast with the technologies. Other challenges cited by respondents were unattractive visual design 32(49%), limited digital resource platforms 30(46%) and mismatch of users' information needs with information sources 27(42%). This may be associated with the subscription to only specific information and affordable number of titles in a pool of many others. For example, KLISC

as a consortium which provide e-resources in full package but only sources subscribed to can be accessed by the users.

4.6.2 Challenges Identified by Library Staff in Charge of E-Content

The study also aimed to ascertain whether the e-content librarians at the libraries encountered any difficulties in delivering efficient information services about the availability and application of information on digital resource platforms by academic staff.

Their responses are presented in Table 4.20.

Table 4.20: Challenges Expressed by Library staff in Charge of E-Content (Multiple Responses)

Challenges	Frequency	Percentage
Inadequate Funding	20	95
Inadequate Digital Literacy Skills	18	86
Inadequate Lib. Staff	15	71
Lack of Support for Training	7	33
Poor Attitude (among academic staff)	5	24

Most respondents indicated inadequate funding 20(95%) and inadequate digital literacy skills 18(86%) among both library and academic staff as a major challenge affecting effective access to information in digital resource platforms among users. Due to inadequate funding and the high cost of information resources universities can only subscribe to few information sources that can be accessed in the platforms. IT skills are key in enabling academic staff to access information in digital environments. David-West

(2022) observes that LIS educators are expected to be digitally literate, to create and consume digital content in their academic work. Respondents also indicated that inadequate staff 15(71%) hampered effective access to information. It is important that library staff also possess the skills so that they can guide their users effectively.

The respondents indicated that libraries experienced inadequate funding which affected digital service delivery. Due to inadequate funding and the high cost of information resources universities can only subscribe to few information sources that can be accessed in the platforms. Also, the respondents observed inadequate digital literacy skills among both library and academic staff as a major challenge affecting effective access to information in digital resource platforms among users. IT skills are key in enabling academic staff to access information in digital environments. David-West (2022) observes that LIS educators are expected to be digitally literate, to create and consume digital content in their academic work. It is important that library staff also possess the skills so that they can guide their users effectively.

4.6.3 Challenges Expressed by University Librarians

In addition, the study sought to find out from university librarians the challenges that the academic staff face with regard to utilization of information in digital resource platforms. UL1stated:

Most of our academic have inadequate digital literacy skills and with the rapid changing technologies, some are unable to cope.

The respondents further noted that the inadequacy in digital literacy skills was a problem affecting both academic and the library staff. The interviews revealed that some library staff do not have the opportunity to update their digital skills even as technologies have

kept changing. This is because universities no longer fund the staff for training for lack of finances. Consequently, it affects access and utilization of information in digital platforms because of lack of capacity to provide appropriate support in important areas including training and guidance of users.

UL2 said:

> *In the past one year we have lost seven staff through deaths yet we have not been able to get replacements. We are so few to deal with the large number of users.*

This may be attributed to the freeze of employment due to inadequate funding. When staff are few, some services are likely to suffer and which may largely affect information user requiring staff support.

The respondent observed inadequate staff and staff turn-over as some of the challenges faced. This may be attributed to job dissatisfaction that cause staff to move from one station to another for better terms.

UL 3 retorted:

Staff are changing jobs so frequently that you can hardly have a well- qualified staff for more than a year.

Staff retention is important if a library is to run smoothly because various specializations. Staff turn-over retards the growth of any organization hence the need for institutions to develop strategies of staff retention.

UL 4 stated:

We are struggling with fast- changing user demands against fewer resources, both staff and information sources. This is a very disturbing challenge in this library but we have no hope of solving this any soon.

The findings from the three categories of respondents show that challenges in accessing and utilizing information in digital resource platforms touch on several issues that need attention by stakeholders hence the necessity for the study so as to come up with concrete possible solutions.

In this case, both the academic staff and library staff agree that inadequate digital literacy skills impede the access and utilization of information in digital resource platforms.

4.7 Suggestions for Effective Access and Utilization of Information in Digital Resource Platforms

The goal of the study was to identify actions that may be taken to lessen the obstacles that prevent students at the chosen public institutions in Kenya from accessing and using digital resource platforms to obtain knowledge. Respondents made a variety of recommendations, which were examined and are shown below.

4.7.1 Suggestions by Academic Staff

The academic staff suggested a range of measures that would mitigate against the challenges experienced in accessing and utilizing information in digital resource platforms in their universities as presented in Table 4.21.

Table 4.21: Mitigation Measures Suggested by Academic Staff (Multiple Suggestions)

Suggestions	Frequency	Percentage
Provide continuous training on technical skills	45	69
Provide more links to access needed information	38	58
Present accessible sources only	34	52
Make the websites more appealing	32	49
User interface should be more interactive	26	40
Subscribe to more digital resource platforms	23	35
Update library websites regularly	22	34
Provide simple search features	18	28
Recruit competent library Staff	17	26

Academic staff respondents suggested that there should be continuous training 45(69%) in technical skills. Such training would make the staff competent enough to effectively utilize information. The rapid changing technologies require constant training in order to keep abreast with the new ways of utilizing information. Respondents also suggested for the provision of more links to access the needed information 38(58%) and present accessible sources 34(52%). Other suggestions were to make the websites more appealing 32(49%). User interface should be more interactive 26(40%), subscribe to more digital resource platforms 23(35%) and update library websites 22(34%). The findings imply that universities provide online information access to support learning, teaching and research, but a number of measures need to be considered to make utilization of information in digital platforms more effective by the staff.

4.7.2 Suggestions for Improvement by Library Staff in Charge of E-Content

Academic personnel should be able to use digital resource platforms to access material, according to recommendations made by library staff responsible for e-content. Table 4.22 provides a summary of the recommendations.

Table 4.22 Mitigation Measures Expressed by Library Staff in Charge of E-Content (Multiple Suggestions)

Suggestions	Frequency	Percentage
Academic staff to embrace and attend DL training	18	86
Increase library funding	16	76
Hire adequate library staff	12	57
University management to support staff training	10	48
Involve library staff in the development of library website	8	38

Most of the respondents suggested that academic staff should embrace and attend digital literacy training offered by library staff 18(86%). Training will help the staff acquire the necessary skills to enable them effectively utilize information in digital resource platforms. Another suggestion cited by respondents was to increase library funding 16(76%). Adequate funding will enable libraries to improve facilities including computers to be used for information utilization. Increased funding will also enable the libraries to hire adequate and qualified staff that can manage library operations without strain and provide expertise guidance to users. Commission for University Education (CUE, 2014) directs that university libraries should have appropriate, adequate staff constituting at least 35%

professionals of the library staff and which is commensurate with the academic programmes offered.

In order to introduce library employees to the latest advancements in the field of information services, the Commission also mandates that they have access to a variety of continuing education opportunities. As provided for by CUE, the university management is expected to hire adequate qualified staff and sponsor the existing library staff for further training through workshops, seminars, conferences, short course and formal training to enable the staff enhance their skills. Odongo (2020) observes that information professionals need retooling through regular training in ICTs, attending workshops and seminars to enhance their skills. This will help the staff to keep pace with the changing technologies in information service delivery.

4.7.3 Suggestions for Improvement by University Librarians

University librarians suggested a range of measures to be put in place to improve access and utilization of information in digital resource platforms.

UL1 suggested:

Universities should enhance library funding so that libraries can subscribe to more content and improve their facilities.

To adequately respond to users' needs the library has to have a collection that is relevant and facilities to support service delivery. When these are lacking then it becomes detrimental to user satisfaction.

UL2 said:

Library staff require training to update their skills especially with the current rapid technological changes.

The University management should provide support for staff training so that the staff can update and enhance their skills in information service delivery.

UL3 suggested:

The University management should consider hiring more staff because as it is now, we are so few to cope with user demands.

Libraries are growing organisms and their growth go hand in hand with human resource for facilitate smooth operations.

UL4said:

The university management need to provide incentives in order to avert high staff turn-over.

The high staff turn -over affects the smooth running of any organization. Appreciation tokens and continuous reviews of terms of service for staff can motivate them and promote retention.

4.8 Formulating a Framework for Access and Utilization of Information in Digital Resource Platforms

The study findings showed that although universities had established digital resource platforms to facilitate users with fast access to information, there was inadequate content to satisfactorily respond to the users' information requirements.

The three most commonly subscribed to digital resource platforms: library website, library OPAC and institutional repositories were not adequate to provide the required information.

Some formats in which contents was presented posed challenges to users in regard to clarity, audibility and interpretation. In addition, the findings showed that the visual design in digital resource platforms fell short of attracting users for repetitive visits. Although the layout of content was systematic, the platforms were overcrowded with inaccessible and also obsolete information. The use of images which is important in the identification of information was inadequate.

Additionally, the findings showed that the colors used in the available digital resource platforms were unattractive and fell short of attracting users to frequently visit the platforms. Also, the search features were not user friendly and users experienced difficulties using them. The study also established that academic staff had inadequate digital literacy skills which are necessary for effective access and utilization of information in the digital environment. Also, library staff lacked the appropriate skills to adequately provide the necessary information services to their users through the digital resource platforms.

The foregoing discussion in regard to the gaps identified by the data collected from the field and literature review points to the need for developing a framework to fill these gaps. The existing frameworks on access and utilization of information in digital environments fail to adequately address the problem of users' inability to effectively access and utilize this information. Some frameworks including the IIRF, OntoUS and the DRF do not take cognizant of the inadequacy of digital content in digital resource platforms. They were developed with an assumption that users will access all the information they require from the platforms.

However, the study findings show that the available types of digital resource platforms were inadequate to respond the user's information needs because university libraries only subscribed to few types of digital resource platforms. This means that users may not find all the information they need as provided for in the frameworks hence the need for a framework that provides for ways of increasing information content.

Similarly, the study findings show that the visual design in the available digital resource platforms in relation to content layout, use of images and color; and search features lacks user centeredness and the users' views and expectations were ignored in the process of developing the platforms. This has affected access to information because of lack of attractiveness and user-friendliness. For digital resource platforms to attract users their views and expectations should be considered. Additionally, findings show that both academic staff and library staff lack adequate digital literacy skills to help them effectively access and utilize information in digital resource platforms. Digital literacy skills empower users to effectively navigate through databases to find the required information. This points to the need for training to equip users with the pre-requisite skills in the digital information environment.

However, the reviewed frameworks do not adequately address this challenge. The proponents IIRF assumed that all users of the framework possess digital literacy skills and have adequate knowledge and familiarity with the digital environment and search engines which is not the case. In addition, the framework for interactive video digital libraries requires its users to have experience, knowledge and domain affiliation. The framework

was developed on the basis of an established ICT infrastructure its functionality based on a fully digitized information environment.

Most public universities in Kenya are still in the implementation stage with regard to library automation hence the framework may not solve the existing problem of access to information. Equally, the framework for Improvement of Access to Information does not solve the problem of access to all types of digital information because its focus is specifically on electronic journals. A framework should be simple to be understood by users through the provision of clear guidelines that facilitate access to all types of information content thus an all- inclusive framework. The study therefore proposed a framework that is comprehensively informed by the findings of the study. The framework is illustrated in Figure 4.4.

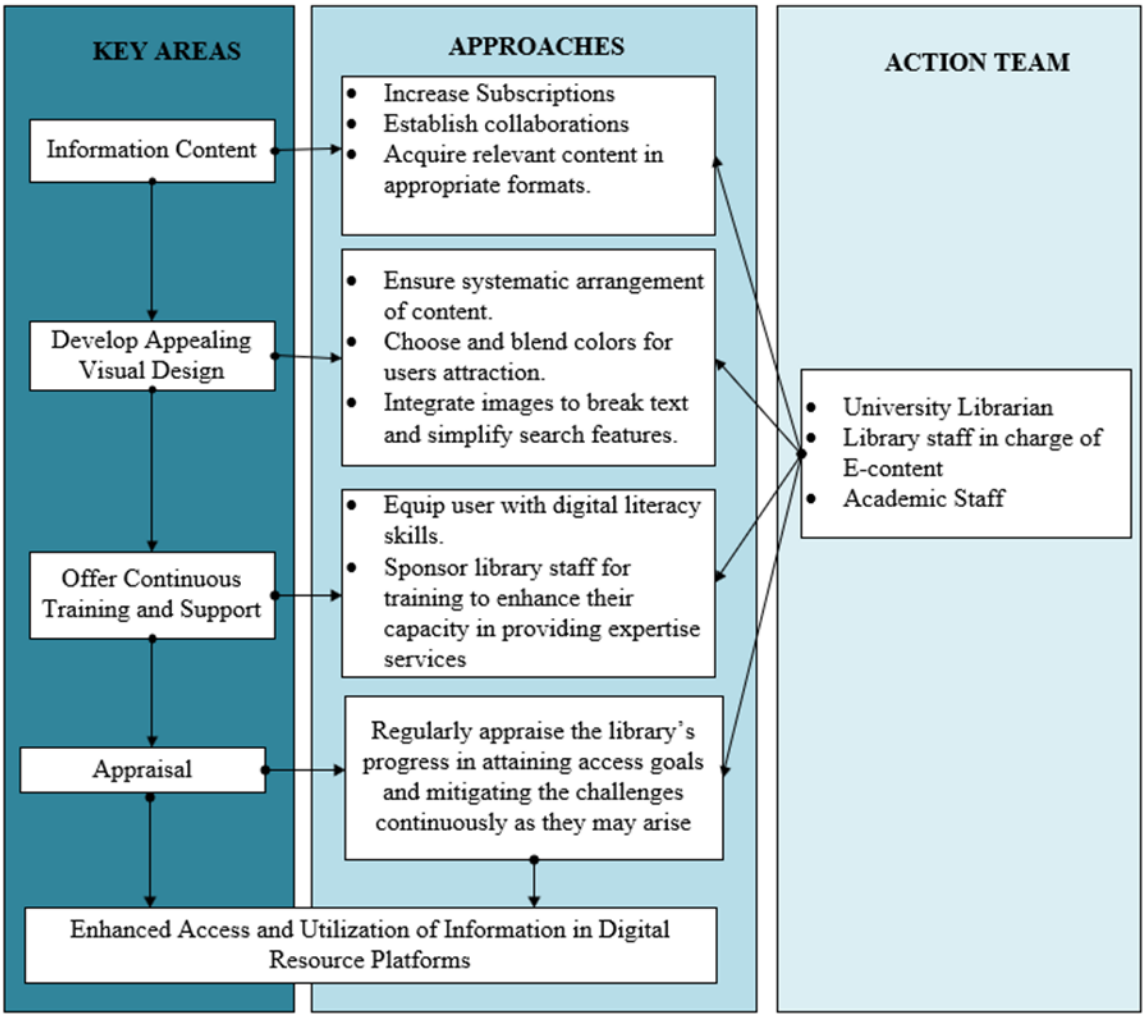


Figure 4.4: Proposed Framework for Information Access and Utilization in Digital Resource Platforms

The proposed framework is a practical tailor-made to respond to issues raised by respondents in the field and considers some unique components that none of the existing reviewed framework provides. These include the visual design in digital resource platforms that has been overlooked by scholars when developing frameworks for information access. Also, in this framework three key teams together play the implementation role notably university librarians, librarians in charge of e-content and academic staff.

Besides, the teams cannot work in isolation but may need to work in collaboration with other stakeholders including the university management who are the financiers and the Information Communication department that may be required to provide some specialized expertise. The framework presents a comprehensive guide for improving access and utilization of information in digital resource platforms in universities. The framework also fills the glaring gaps in the existing frameworks that impede effective access and utilization of information in digital resource platforms. The framework provides for four key areas that were identified in the study findings as areas of concern and also presents various approaches to achieving its goal.

Information content is important and its availability in adequate amounts would respond to the users' information needs. Libraries struggle with high demand for information by users hence the need to increase subscriptions so as to expose users to wider coverage of information. This can be achieved through collaborations where librarians come together to form consortiums locally, regionally and internationally so that they can buy subscriptions together. Buying in bulk as a group will assist libraries to have access to more resources and will lessen the burden of buying singly and access less content. University librarians also need to request for more funding from the university management to enable the library purchase more content. Also, university librarians working together with their staff as guided by the framework should ensure the library subscribes to relevant content that respond to the users' needs and in formats that are appropriate for their users. Users of digital resource platforms have varied preferences with regard to formats and types of content which should not be overlooked by the library staff.

Visual design in digital resource platforms is key in supporting access and utilization of information in a digital environment. The study findings showed that unattractive visual design may repulse users from accessing information in digital resource platforms.

This involves the use of images, color and search feature that are user-friendly. The proposed framework guides university librarians, library staff in charge of e-content in collaboration with ICT staff to work together on the visual design of digital resource platforms so as to take care of user preferences. The study established that universities have corporate colors which they prefer using. However, literature reveals that peoples' orientations with color may affect their choices. The framework guides that university librarians should share the information and negotiate with the university managements on choosing and blending of colors that may support or attract users.

Also, library staff in charge of e-content in collaboration with ICT personnel should facilitate the integration of images to break text that make reading of some content monotonous and also assists in information identification. Some users may wish to identify with specific authors and uploading of their images on the top pages attracts use. Library staff in charge of e-content should simplify the search features to the understanding and ease of use by information users. This also calls for full involvement of library staff in charge of e-content in the development of library websites. This is necessary because the staff are more familiar with the user needs and hence will be user focused as opposed to ICT personnel. The involvement of both ICT staff and library staff in the development of digital resource platforms will yield to visual design that is appealing to users. This is because library staff in charge of e-content understands the user requirements with regard

to access and utilization of information and will present user focused needs hence enhance access to information.

In addition, users must be equipped with digital literacy skills as a prerequisite in accessing and utilizing information digital resource platforms. This can be done through continuous training by library staff in charge of e-content. The study established that although university libraries offered digital literacy training to academic staff at varied intervals, it was found that the staff had inadequate skills. The proposed framework provides that library staff should be sponsored for training to enhance and update their skills. This can be done by the university management through providing finances for library staff to go for seminars, workshops and short courses.

Finally, regular assessment of the information delivery systems in libraries with regard to access to information and utilization should be conducted. This will ensure the systems are working well and if not identify any problems for correction and improvement. The proposed framework appropriately fits in solving the existing challenges in accessing and using information in digital resource platforms in universities in Kenya and beyond, particularly those facing the same challenges.

4.8.1 Framework Evaluation

The proposed framework is expected to achieve its intended objective of facilitating effective access and utilization of information in digital resource platforms in university libraries. Table 4.23 is a representation of the evaluation of the proposed framework.

Table 4.23: Framework evaluation

Objective		How it Will Achieve the Objective
1	Information Access	Increased subscriptions and acquisition of more content will result to adequate content thus promote access
2	Appealing visual Design	Systematic arrangement of content, use of images and color and simple search features will attract repetitive visits to the platforms by users to access and utilize information
3	Enhance Digital Literacy Skills	Through continuous Training users will be equipped with the necessary digital literacy skills that will enable them to effectively access and utilize information in digital resource platforms.
4	Appraisal	Through conducting regular user surveys to ascertain the performance of the framework

The proposed framework will achieve its objectives through the increase in subscriptions to more digital resource platforms and hence acquisition of more content that will result to adequate content that will promote access to information. An appealing visual design will be achieved through systematic arrangement of content, use of images and color and simple search features will attract repetitive visits to the platforms by users to access and utilize information. The proposed framework will also achieve enhanced digital literacy among users through continuous training to equip them with the necessary digital literacy skills enable them access and utilize information in digital resource platforms effectively.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter summarizes the research findings, draws conclusion and makes recommendations based on the study findings.

5.2 Summary of the Findings

A framework for development is required in light of the study's noteworthy findings on the availability and use of information on digital resource platforms in higher education. The study's goals are followed in the summary and presentation of the findings.

5.2.1 Digital Resource Platforms in the Selected Public Universities

Establishing the scope of the colleges under investigation's digital resource platforms was the initial goal. According to the survey, university libraries offered a variety of digital resource platforms, the most popular of which were institutional repositories, library websites, and library OPACs. Other platforms that were available were Publishers platforms, Open Journal System (OJS) and Open Educational Resources (OERs) which were found to be least known to the users. The university librarians stated that they were unable to adequately respond to the users' information needs because of limitation in subscriptions to e-content. In addition, the study found out that much of the digital content was in textual and audio-visual formats. There was some content that was in video, visual and audio with little content in graphical format.

Respondents expressed that graphical and video contents were difficult to use because they were not easy to interpret and understand. It was also established that the available digital platforms mainly contained electronic journals and e-books which were indicated as frequently used by academic staff. Other types of digital content were theses, conference proceedings and research publications

5.2.2 Visual Design in Digital Resource Platforms

The study also sought to assess the visual design in digital resource platforms in the selected public universities. The study established that the arrangement of content in the platforms was systematic where similar and related items were grouped together. However, images and text to communicate needed information were not provided. The layout was not attractive to enable users interpret messages the design conveyed and there were no clear paths for navigation to facilitate creating content hierarchies that guide users and also lacked good balance between text-to-graphics.

Majority 14(61%) of the respondents indicated that the layout did not support utilization of information since websites were bloated and overcrowded making it difficult for users to easily identify the specific information that they needed. The use of images and color were found to be lacking users were provided with limited keywords and phrases. Respondents were neutral that users browse the entire website in search of relevant information. Search features were complicated to understand and that filters had been provided for ease of identification of relevance information. Respondents disagreed that links to publishers and other sources not in the collection were provided and also submitted that the visual design of the digital platforms lacked user focus and did not adequately facilitate effective utilization of information.

5.2.3 Digital Literacy Skills among Academic Staff

The research sought to determine the adequacy of digital literacy skills among academic staff. The study established that academic staff competencies were good in finding information but were uncertain about communication and netiquette, critical thinking, functional skills, online safety skills and digital culture. The study found that most respondents were competent in using laptops, smartphones and desktop computers to access information and neutral in the use of tablets. Digital literacy trainings were conducted in all the universities studied but at different intervals. Respondents were uncertain about the effectiveness of the training which covered the use of web browsers, using search engines, accessing information in digital formats, evaluation of online sources, how to navigate through databases and how to operate computers.

The study also established that although academic staff had embraced technology, some by compulsion, its adoption was slow and respondents had a mind-set that the platforms in public universities were still below the required standards viewing them as underdeveloped. In addition, library staff were not involved in the development of library websites but instead the ICT personnel developed the websites which has led loss of user focus bearing in mind that the library staff are better placed in understanding user needs.

5.2.4 Challenges Experienced in Accessing and Utilizing Information in Digital Resource Platforms

The fourth objective sought to establish the challenges experienced in accessing and utilizing information in digital resource platforms. The challenges were: limited digital resource platforms, obsolete information, technological dynamism and inadequate technical skills.

Both users and library staff did not have adequate technical skills that are required in digital resource platforms. Users were provided with limited links to sources and therefore narrowing the scope for searches while some sources were inaccessible although they had been listed the collection which is attributable the libraries' subscription to a few specific sources in databases with large collections.

In addition, the study established that the visual design of digital resource platforms was not attractive to users with regard to content layout, use of images, color and search features. Users were inadequately guided because library staff lacked adequate expertise to provide the needed guidance to users. Library staff in charge of e-content noted that academic staff had poor attitude towards library staff with regard to their capacity to provide quality services and particularly e-resource services. Libraries were also experiencing dwindling budgets making them unable to provide sufficient and appropriate services. This also affected support for staff training to enhance their skills, hiring more qualified staff as well contributed to high staff turnover because of lack of promotions.

5.2.5 Suggestions for Effective Utilization of Information in Digital Resource Platforms by academic Staff in Universities

The respondents suggested various mitigation measures to address the challenges that hinder effective utilization of information in digital resource platforms in the selected public universities in Kenya. Respondents suggested for increased subscriptions to information resources. This would provide access to a wide scope of information that would facilitate effective teaching, learning, research and innovation activities. Respondents also felt that digital resource platforms should be regularly updated and

constantly update users of new collections which will encourage repetitive visits by users thus attract regular use.

Respondents also expressed the need for continuous digital literacy training to deal with the challenge of fast changing technologies. This would help both the users and staff to enhance and update their digital literacy skills that are a prerequisite for effective utilization of digital resource platforms. Academic staff suggested that the library should provide more links to sources of information and collaborate with database owners to share links to sources not in the collection. Library staff in charge of e-content suggested that they should be involved in the process of developing digital platforms particularly library websites so as to fully incorporate user preferences and hence make the visual design more appealing to users. Respondents also suggested that library funding should be enhanced. Increase in library funding will enable the library not only increase subscriptions to information resources but also acquire more appropriate facilities that support information services. Improved funding would also enable the library to recruit more staff, sponsor the existing staff for training to enhance their skills, and provide incentives to the staff to curb staff turn-over. Increased subscriptions, improved facilities and empowered library staff in terms of enhanced skills will change the negative attitude among academic staff towards library staff and digital resource platforms and in turn improve access to information.

5.3 Conclusion

This study found out that although public universities had made efforts to make information available through establishing and subscribing to digital resource platforms that facilitate quick access and utilization of information by academic staff. However, the digital platforms are still not effective and fall below the intended purpose for which they were

developed. The available digital resource platforms were few, some not known to users and the accessible content was found to be inadequate.

Library websites, OPACs and institutional repositories are the most common platforms. Textual formats are dominant although there is also considerable content in audio-visual, video, and visual, audio and graphical formats. Users frequently access electronic journals, e-books and theses due to their currency. The respondents felt that university management needed to increase funding to enable libraries increase subscriptions so that they can provide a wider scope of information that support academic activities in public universities in Kenya.

Similar and related items are arranged together to enable fast, easy and limitless access to information but layout of digital resource platforms was found to be unappealing to users. The content in these platforms were overcrowded and bloated with obsolete information that repulse users who wish to access relevant current information. Librarians in charge of e-content should ascertain the needs of users and carry out continuous weeding of all the outdated information. Search features and filters should be provided to enable users easily identify relevant information and thus save time which also makes the system easy to use and attractive. The importance of using images particularly of authors for information identification was untapped and the choice of color lacked an attractive blend. Users were also impatient with information searches because of unclear navigation paths and few search links. Overall, the general design of digital resource platforms did not attract effective access to information because it lacked user focus.

Academic staff have inadequate digital literacy skills that curtailed them from accessing information effectively. Nevertheless, the staff are competent in using laptops, smartphones and desktop computers to access information except in using tablets. Library staff conducted trainings to equip academic staff with digital literacy skills but covered only a few aspects that may not assist users to become independent in their searches.

Some users felt library staff had no capacity to offer the training on digital literacy skills hence did not attend the trainings resulting to slow adoption of technology. Besides, academic staff views digital resource platforms as underdeveloped and have a notion that library staff lack the capacity provide e-content services. There is also a notion among university management that the ICT personnel is the best placed to develop digital resource platforms without involving library staff which has led to a mismatch of information systems and user needs.

The study confirmed the assumptions provided at the beginning of the study. Foremost, the study confirmed that academic staff uses the available digital resource platform services in their university libraries. Most academic staff indicated that they used library websites, library OPACs and institutional repositories for their information needs. The second assumption claimed that universities had established digital resource platforms for information utilization. This was found to be true when academic staff were asked about the available digital resource platforms. The staff indicated that there were three popular digital resource platforms (OPAC, library website and institutional repository). This implies that digital resource platforms had been developed to facilitate utilization of information.

Major challenges affecting effective access and utilization by academic staff were numerous and multifaceted. The major challenges faced by academic staff in accessing and utilizing information in digital resource platforms were inadequate content, dynamic technological landscape, inadequate technical skills, limited links to specific information, unattractive visual design and poor attitude among academic staff. To mitigate the challenges the respondents suggested for subscription to more digital resource platforms, regular update of library websites. Other suggestions included a user focused visual design, provision of continuous digital literacy training, provision of more links to information sources in the collection and those not in the collection and enhancement of library funding.

Overall, the study established that the academic staff were unable to effectively utilize information in digital resource platforms. This was occasioned by various issues ranging from information content, visual design to prerequisite technical skills needed in digital platforms. Based on the findings of the study, it follows that ensuring effective utilization of information in digital resource platforms in public universities depends on the various interconnected issues. While it can be appreciated that public universities are making efforts to facilitate libraries to provide information to their users, they were apparently inadequate and need resolute effort from various stakeholders. Consequently, the study came up with a framework for access and utilization of information for research and teaching in digital resource platforms. This is meant to address the problems that hinder effective use of digital resource platforms.

5.4 Recommendations

The study proposed the following recommendations

5.4.1 Increase Digital resource platforms (Content)

The findings showed that digital resource platforms were valuable instruments for teaching, learning and research in public universities in Kenya, but the available ones were few and not effectively utilized. This was linked to the library's subscription to only a few digital resource platforms and to limited content due to inadequate funding. To mitigate these challenges university librarians should collaborate with more content developers and consortia. Joining consortiums will allow for buying subscriptions together as university libraries hence reduce on cost. Also, university librarians should negotiate with content developers and publishers on subscription rights that limit access to some information resources and sign working agreements that allow for links to access more information resources. ICTs have changed the function of librarians from information providers to being information consultants to users.

Respondents also observed that some content in the platforms was inaccurate and misleading. To mitigate these challenges the university librarians should ensure periodic reviews of the collections to weed out outdated content and create space for new content. Policies on weeding should be put in place and operationalized so as to have a useful collection. It is also important that users are made aware and kept posted about all the available information resources in the libraries.

5.4.2 Involvement of Library Staff in Library Website Development

The visual design of digital resource platform is one of the important determinants of whether the content there in will be accessed and utilized effectively or not. The study established that the visual design of digital resource platforms was unattractive and did not

effectively support access and utilization of information. It was established that Library staff who are key when it comes to user information requirements and preferences were not involved in the development of library websites resulting to inappropriate designs that lack user focus. The study recommends that library staff in charge of e-content should be fully involved in the whole process of developing library websites. The staff is aware of user needs and their involvement would be useful in designing a user focused platform that will attract users. Effective access and utilization of information in any digital resource platform is determined by how well it responds to user expectations.

5.4.3 Offer Continuous Digital Literacy Training

Capacity building is necessary for both users and library staff to keep abreast with the ever-changing technologies. The study found out that academic staff had inadequate digital literacy skills to enable them effectively access and utilize information in digital resource platforms. The study recommends that Library staff in charge of e-content should ensure that users are well equipped with digital literacy skills by offering continuous digital literacy training.

When academic staff are digitally literate, they will easily and quickly adopt technology, which will also make them embrace digital resource platforms in universities and consequently enhance access to information. The study established that libraries were run on stringed budgets that affected their performance. The study recommends that the university librarians should negotiate with the University management to enhance library staff's capacity through training that will enable them constructively participate in the development of library websites and also conduct effective user training. Consequently,

this will contribute to effective access and utilization of information in digital resource platforms by academic staff.

5.4.4 Adoption of the Proposed Framework

The study established that the existing frameworks for access and utilization of information were lacking in some aspects that needed improvement. The study recommends that university libraries adopt the proposed framework illustrated in Figure 4.4. The proposed framework is aimed at significantly improving access and utilization of information in digital resource platforms in universities. The framework is expected to defeat the bottlenecks that have persistently negated the gains of the digital resource platforms.

5.5 Recommendations for Further Research

The study identified several aspects that could be the subject for further research by other researchers in the field as follows:

This study was limited to LIS faculty members at four (4) reputable public universities: Kenyatta University, Moi University, Egerton University, and University of Nairobi.

Consequently, it is suggested that comparable research be done on other university user groups to find out how they access and use digital resource platforms.

Additionally, a comparison between public and private universities was suggested by the study. This is because the two categories of universities operate under different funding capabilities and may have different advantages in terms of resources.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION TO RESPONDENTS

Dear respondent

My name is Anne Nakhumicha Tenya, a PhD student in the School of Information Science and Technology at Kisii University. I am conducting research for a Doctor of Philosophy in Information Science. My research topic is: **Access and Utilization of Information in Digital Resource Platforms for Teaching and Research by Academic Staff in Selected Public Universities in Kenya**. The research seeks to establish the range of digital resource platforms available in the universities; the visual design of digital resource platforms, determine the adequacy of digital literacy skills among academic staff, establish challenges that hinder effective access and utilization of information among academic staff for the purpose of developing a framework for improvement. You have been identified as a participant and I will appreciate your responses to the questions posed. Please note that the information you provide in this study will not be used for any other purpose that might cause damage to your reputation, integrity, emotions, or professional conduct. The information will be treated with confidentiality as individual responses will not be identifiable but treated in aggregate when reporting the findings. I will appreciate your honest responses and clarifications where necessary.

Yours sincerely,

Anne Nakhumicha Tenya

APPENDIX II: QUESTIONNAIRE FOR ACADEMIC STAFF

SECTION A: DIGITAL RESOURCE PLATFORMS

1. Which of the following types of digital resource platforms are available for teaching and research in your university library? You can tick (√) more than one.

Library Website ( ) Library OPAC ( ) Publishers platform ( ) Digital Repository ( )

Any other, please indicate, ...

2. Which of the following formats of digital content is information presented in the available digital resource platforms? You can tick (√) more than one.

Audio Only ( ), Visual Only ( ), Audio-visual ( ), Textual ( ), Video ( ), Graphical ( )

Any other, please

indicate……

3. In a scale of 1- 5, assess the formats of digital content on the specific transcribed aspects. Please tick (√) accordingly using the key provided: Strongly Disagree -1; Disagree -2; Neutral- 3; Agree- 4; Strongly Agree- 5

Types of Digital Content	**Variables**				
	1	2	3	4	5
Audio content is audible enough for users					
Visual content is displayed in clear colors					
Audio-visual content is both audible and clear					
Textual content is legible to users					
Graphical content is difficult to interpret					

SECTION B: VISUAL DESIGN OF CONTENT IN DIGITAL RESOURCE PLATFORMS

4. In a scale of 1-5 please indicate by ticking (√) once in each row: Strongly Disagree- 1; Disagree-2; Partially Agree-3; Agree-4; Strongly Agree-5 with the following statements about the layout of content in the digital resource platforms in your university.

Layout of Content in Digital Resource Platforms	Variables				
	1	2	3	4	5
Similar and related items are grouped together (well organized)					
Images and text are provided to communicate needed information when accessing information.					
There is a good balance between of text-to- graphics.					
The layout is attractive and enables a user understand the message the design is conveying (user-friendly).					
Clear paths for navigation are facilitated creating content hierarchies that guide users in accessing needed information.					

b) Any other comment, please specify……

5. In a scale of 1- 5 please indicate by ticking (√) once in each row: Strongly Disagree-1; Disagree-2; Neutral-3; Agree-4; Strongly Agree with the following statements about use of images in digital resource platforms in your university.

Use of Images in Digital Resource Platforms	**Variables**				
	1	2	3	4	5
Images of contact persons are included for ease if information identification					
Images have been used effectively to break blocks of text					
Attractive images have been used to enhance repetitive use					
Relevant images have been used to enhance users' user experience					

b) Any other comment about use of images, please specify……

6. In a scale of 1-5 please indicate by ticking (√) once in each row: Strongly Disagree-1; Disagree-2; Neutral-3; Agree-2; Strongly Agree-5 with the following statements about use of color in digital resource platforms in your university library.

Use of Color in Digital Resource Platforms	**Variables**				
	1	2	3	4	5
Colors used are monotonous and not appealing for repetitive use					
The colors are dull and do not attract frequent use.					
The colors used spark interest among users and help in processing and storing images					

Colors are well blended to enhance user experience					

b) Any other comment about color, please specify……

7. (a) In a scale of 1-5 please indicate by ticking (√) once in each row: Strongly Disagree-1; Disagree-2; Neutral-3; Agree-4; Strongly Agree-5 on the following statements about search features in the digital resource platforms in your university.

Search Features in Digital Resource Platforms	**Variables**				
	1	2	3	4	5
Limited keywords and phrases have been provided for searching information					
Users browse the entire website in search of relevant information					
Search features are complicated to understand and use					
Filters have been provided for ease of identification of relevant information					
Links to publishers and other sources not in the collection have been provided					

b) Any other comment on search feature, please specify……

SECTION C: ADEQUACY OF DIGITAL LITERACY SKILLS AMONG ACADEMIC STAFF

8. In a scale of 1-5 please indicate by ticking (√) once in each row: Very Poor-1; Poor-2; Fair-3; Good-4; Ver Good-5 about the following statements how you rate your competence in the listed areas of digital literacy skills.

Digital Literacy Competencies	**Variables**				
	1	2	3	4	5
Online Safety Skills					
Digital Culture					
Critical Thinking					
Functional Skills					
Communication and Netiquette					
Finding Information					

b) Any other comment about your digital literacy skills, please specify……

9. In a scale of 1-5 please indicate by ticking (√) once in each row: Strongly Disagree-1; Disagree-2; Neutral-3, Agree-4; Strongly Agree-5 how you rate your competence in using the following digital devices to access and use information in digital resource platforms.

Digital Devices	**Variables**				
	1	2	3	4	5
Using the laptop to access information					
Using a smartphone to search and access information					
Using a tablet to search and access information					
Using desktop computer to access information					

b) Any other digital device(s) that you use, please specify

……

10a). Has the library staff conducted any digital literacy training to equip you with digital literacy skills? Yes ( ) No ( ) Not Sure ( )

b) If your answer in 'a' above is 'Yes', please indicate by ticking (√) once in the brackets the frequency of the trainings.

Monthly ( ) Once in a Semester ( ) Twice in a Semester ( ) Once in an Academic year()Continuous ( )

b) Please indicate by ticking (√) once in the brackets the aspects of digital literacy that you were trained:

How to use web browsers ( ) How to use search engines ( ) How to access relevant information ( ) How to evaluate online resources ( ) How to navigate through databases ( ) How to operate a computer ( )

c) Any other, please specify…….

11. In a scale 1-5 please indicate by ticking (√) once in each row: Don't Know-1; Not Effective-2; Fairly Effective-3; Effective-4; Quite effective-5 how you rate the effectiveness of the training in the listed areas of digital literacy skills.

Aspects of Training	**Variables**				
	1	2	3	4	5
How to use web browsers					
How to use search engines					
How to access relevant information in digital formats					
How to evaluate online resources					
How to navigate through databases					
How to operate a computer					

e) Any comment, please specify…….

12. Give your general comments/suggestions about your digital literacy skills with regard to access and utilization of information in digital resource platform in the University…….....

13. In a scale of 1-5 please indicate by ticking (√) once in each row: Strongly Disagree-1; Disagree-2; Partially Agree-3; Agree-4; Strongly Agree-5 with the following statements about technology adoption among academic staff.

Statement on Technology Adoption	**Variables**				
	1	2	3	4	5
New technology has enabled me to accomplish tasks faster					
I find new technology useful in my work					
I have no time to learn how to use new technology					
I find new technology difficult to use					
I am slowly embracing technology in accessing information					
I prefer the traditional information access methods					
Technology has increased the cost of accessing and utilizing information					

14a). In a scale of 1-5 please indicate by ticking (√) once in each row: Strongly Disagree-1; Disagree-2; Partially Agree-3; Agree-4; Strongly Agree-5 with the statements about academic staff attitude towards using digital resource platforms as sources of useful information for learning, teaching and research.

Statement about Attitude Towards Digital Resource Platforms	**Variables**				
	1	2	3	4	5
Digital resource platforms in public universities are underdeveloped					
Accessing information in DRPs is complicated					
Digital resource platforms in public universities are poorly designed					
Finding information in digital resource platforms is time consuming					
Digital resource platforms are for the younger generation					

b) Any other view with regard to digital resource platforms, please specify

……

15. Please give your general comment technology adoption among academic staff in accessing and utilizing digital resource platform in your university?.....

SECTION D: CHALLENGES ENCOUNTERED BY ACADEMIC STAFF IN ACCESSING AND UTILIZING INFORMATION IN DIGITAL RESOURCE PLATFORMS

17. What challenges do you experience in accessing and utilizing information in digital resource platforms your university library?.....

18. What in your view should be done to improve access and utilization of information in digital resource platforms by academic staff?.....

19. Please provide any other comments and/or suggestions with regard to addressing challenges of access and utilization of information in digital resource platforms in universities

Thank you for participating in the study.

APPENDIX III: QUESTIONNAIRE FOR ACADEMIC STAFF (Administered via googledocs)

Kindly find the link:
https://forms.gle/jjRxVo23rbnb5CsG6

APPENDIX IV: QUESTIONNAIRE FOR LIBRARY STAFF IN CHARGE OF E-CONTENT

SECTION A: DIGITAL RESOURCE PLATFORMS

1 a). In a scale of 1-5 please rate the frequency of access to the underlisted digital resource platforms for teaching and research by academic staff. Please indicate by ticking (√) once in each row using the key: Not at All-1; Not Frequent-2; Faily Frequent-3; Frequent-4; Very Frequent-5

Digital Resource platforms	**Variables**				
	1	2	3	4	5
Library website					
Institutional Repository					
Online Public Catalog (OPAC)					
Publishers Platforms					

b) Please explain the reason for your rating in 'a' above…….

2. Please indicate the frequency of access to the following type(s) of digital content in your university digital resource platforms. Please indicate by ticking (√) once in the brackets using the key: Never-1, Not Frequent-2, Fairly Frequent-3, Frequent-4, Very Frequent-5

Types of Digital Content	**Variables**				
	1	2	3	4	5
Electronic Journals					
E-Books					
Theses					
Research Publications					
Conference Proceedings					

SECTION B: VISUAL DESIGN OF CONTENT IN DIGITAL RESOURCE PLATFORMS

3. In your view, does the layout of content support/facilitate users in accessing information?

Yes ( ) No ( ) Not Sure ( )

c) Please explain your answer in 'b' above ……

SECTION C: DIGITAL LITERACY SKILLS OF ACADEMIC STAFF

4. In a scale of 1-5 rate the digital literacy competencies of academic staff in the underlisted digital operations: Please indicate by ticking (√) using the key: Very Low-1; Low-2; Moderate-3; High-4; Very High-5

5. Please give your general views/comment about the digital literacy skills among academic staff with regard to accessing and utilizing information the available digital resource platforms in your university…….

SECTION E: CHALLENGES ENCOUNTERED BY ACADEMIC STAFF IN ACCESSING AND UTILIZING DIGITAL RESOURCE PLATFORMS

16. In your view, what challenges does the academic staff experience in accessing and utilizing information in digital resource platforms?.....

17. In your view, what should be done to mitigate the challenges you have indicated?

……

18. Please provide any other comments and/or suggestions that you would like to make with regard to addressing challenges in accessing and utilizing information in university digital resource platforms.

Thank you for your participation

APPENDIX V: INTERVIEW GUIDE FOR UNIVERSITY LIBRARIANS

SECTION A: DIGITAL RESOURCE PLATFORMS

1. What types digital resource platforms are available to support teaching and research in your university library?

2. In your view, do you think the available digital resource platforms are adequate to respond to the academic staff needs?

3. Please explain what types of digital content does your university library subscribe to?

4. How would you explain the frequency of access to the types of digital content in your library and the reasons you could attribute to it?

SECTION B: VISUAL DESIGN IN DIGITAL RESOURCE PLATFORM

5. Content layout in digital resources platforms can facilitate or hinder access and utilization of information. As an expert managing information service provision, how would you describe the layout of content in the available digital resource platforms?

6. The use of images of contact persons such as authors enhances the identification of information and its access. In your view, please explain the extent to what extent have you integrated images with text in your collection?

7. The colors in a website are central in influencing the attraction of users to the platform. To what extent has the choice and blend of color been used to attract users to repetitive access to information in the digital resource platforms in the university?

8. Search features are important in assisting users to easily find relevant content. How would you describe the search features in the available digital resource platforms?

SECTION C: DIGITAL LITERACY SKILLS AMONG ACADEMIC STAFF

9. Please explain how you ensure that academic staff are adequately equipped with skills to enable them effectively access and utilize information in the digital resource platforms?

10. Acceptance of technology is key for effective access and utilization of information in digital resource platforms among users. In your view, please explain the adoption of technology among academic staff?

11. In developing library websites, user focus is key in responding to ascertained expectations of users. In this regard, please explain the extent to which library staff are involved as the information professional?

12. In your opinion, do you think the academic staff views the available digital resource platforms as reliable sources of information for their teaching and research work?

SECTION D: CHALLENGES ENCOUNTERED BY ACADEMIC STAFF IN ACCESSING AND UTILIZING INFORMATION IN DIGITAL RESOURCE PLATFORMS

13. In your view, what challenges does academic staff experience in accessing and utilizing information in the digital resource platforms in the University?

14. What in your view should be done in order to address the challenges indicated?

Thank You for Your Participation

APPENDIX VI: RESEARCH PERMIT FROM NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 408228

Date of Issue: 25/November/2021

RESEARCH LICENSE

This is to Certify that Ms.. Anne Nakhumicha Tenya of Kisii University, has been licensed to conduct research in Kiambu, Nairobi, Nakuru, Uasin-Gishu on the topic: INFORMATION ACCESS FRAMEWORK FOR IMPROVING UTILIZATION IN DIGITAL RESOURCE PLATFORMS BY ACADEMIC STAFF IN SELECTED PUBLIC UNIVERSITIES IN KENYA for the period ending : 25/November/2022.

License No: NACOSTI/P/21/14619

408228

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

APPENDIX VII: ETHICAL APROVAL LETTER FROM EGERTON UNIVERSITY RESEARCH COMMITTEE

EGERTON UNIVERSITY
TEL: (051) 2217808
FAX: 051-2217942
P. O. BOX 536
EGERTON

EGERTON UNIVERSITY RESEARCH ETHICS COMMITTEE

EU/RE/DVC/009
Approval No. EUREC/APP/171/2022 **29th March, 2022**

Anne Nakhumicha Tenya
Address: BOX 377-20100, NAKURU
Telephone: 0727 895 535
E-mail: annetenya@gmail.

Dear Anne,

RE: ETHICAL APPROVAL: INFORMATION ACCESS FRAMEWORK FOR IMPROVING UTILIZATION IN DIGITAL RESOURCE PLATFORMS BYACADEMIC STAFF IN SELECTED PUBLIC UNIVERSITIES IN KENYA

This is to inform you that *Egerton University Research Ethics Committee* has reviewed and approved your above research proposal. Your application approval number is *EUREC/APP/171/2022.* The approval period is *29th March, 2022 –30th March, 2023.*

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by *Egerton University Research Ethics Committee*.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to *Egerton University Research Ethics Committee* within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to *Egerton University Research Ethics Committee* within 72 hours
v. Clearance for Material Transfer of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.

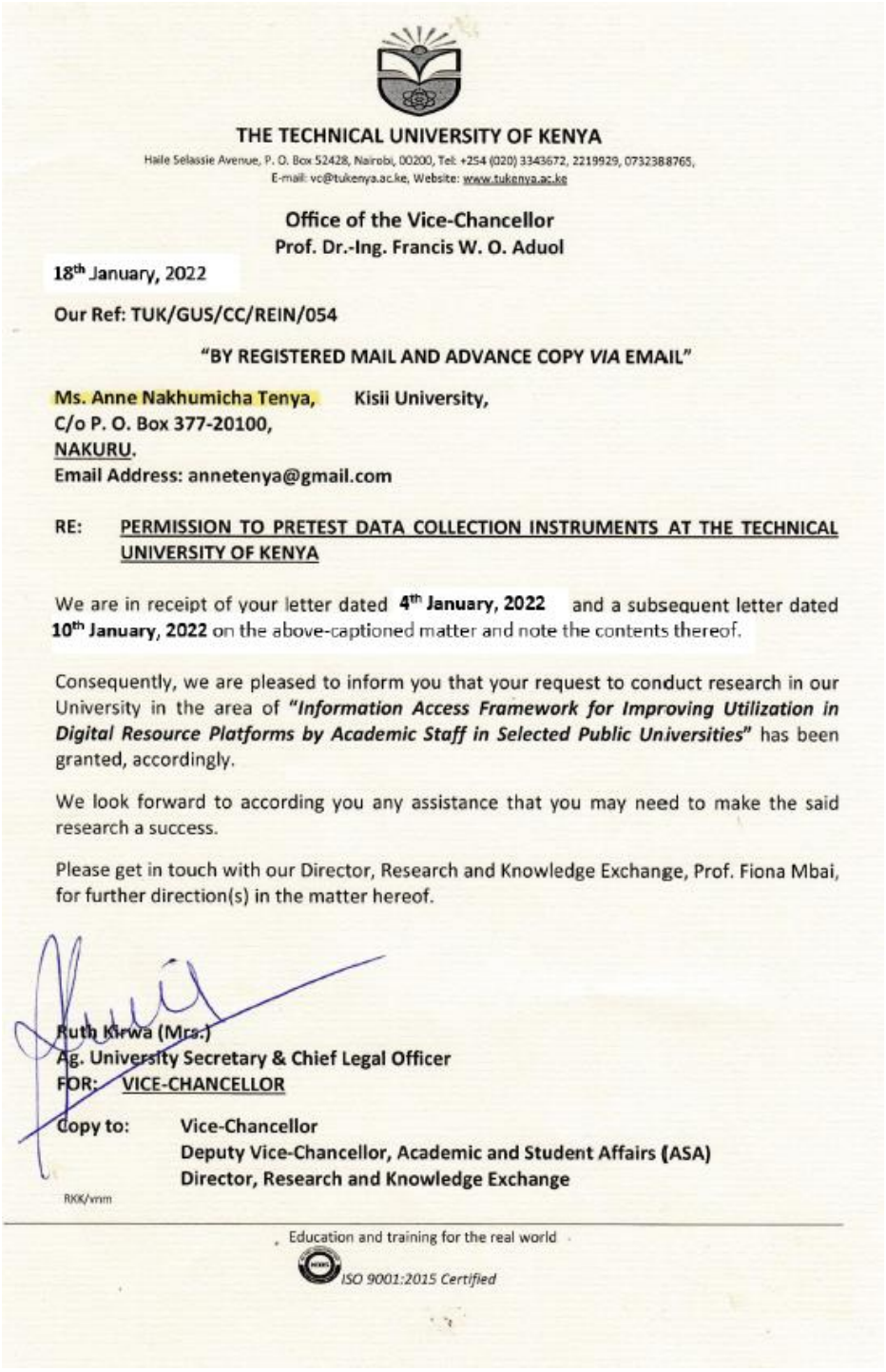
vii. Submission of an executive summary report within 90 days upon completion of the study to ***Egerton University Research Ethics Committee***.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely.

Prof. R. Ngure
CHAIRMAN, EGERTON UNIVERSITY RESEARCH ETHICS CTTEE
RMN/BK/

APPENDIX VIII: AUTHORIZATION LETTER FOR PRETESTING DATA COLLECTION INSTRUMENTS FROM TECHNICAL UNIVERSITY OF KENYA



THE TECHNICAL UNIVERSITY OF KENYA

Haile Selassie Avenue, P. O. Box 52428, Nairobi, 00200, Tel: +254 (020) 3343672, 2219929, 0732388765,
E-mail: vc@tukenya.ac.ke, Website: www.tukenya.ac.ke

Office of the Vice-Chancellor
Prof. Dr.-Ing. Francis W. O. Aduol

18th January, 2022

Our Ref: TUK/GUS/CC/REIN/054

"BY REGISTERED MAIL AND ADVANCE COPY *VIA* EMAIL"

Ms. Anne Nakhumicha Tenya, **Kisii University,**
C/o P. O. Box 377-20100,
NAKURU.
Email Address: annetenya@gmail.com

RE: PERMISSION TO PRETEST DATA COLLECTION INSTRUMENTS AT THE TECHNICAL UNIVERSITY OF KENYA

We are in receipt of your letter dated **4th January, 2022** and a subsequent letter dated **10th January, 2022** on the above-captioned matter and note the contents thereof.

Consequently, we are pleased to inform you that your request to conduct research in our University in the area of ***"Information Access Framework for Improving Utilization in Digital Resource Platforms by Academic Staff in Selected Public Universities"*** has been granted, accordingly.

We look forward to according you any assistance that you may need to make the said research a success.

Please get in touch with our Director, Research and Knowledge Exchange, Prof. Fiona Mbai, for further direction(s) in the matter hereof.

Ruth Kirwa (Mrs.)
Ag. University Secretary & Chief Legal Officer
FOR: VICE-CHANCELLOR

Copy to: **Vice-Chancellor**
Deputy Vice-Chancellor, Academic and Student Affairs (ASA)
Director, Research and Knowledge Exchange

RKK/vnm

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APPENDIX IX: AUTHORIZATION LETTER FOR DATA COLLECTION FROM UNIVERSITY OF NAIROBI

UNIVERSITY OF NAIROBI
OFFICE OF ASSOCIATE VICE-CHANCELLOR
(Research, Innovation and Enterprise)

P.O. Box 30197-00100
Nairobi, Kenya
Website: dvcric@uonbi.ac.ke

Fax: +254-2-2317251
Email: avcric@uonbi.ac.ke

UON/RIE/3/5/Vol.XX / **February 1, 2022**

Ms. Anne Nakhumicha Tenya
Kisii University
P.O Box 408 -40200
Kisii

E-mail: annetenya@gmail.com

Dear Ms. Tenya,

PERMISSION TO COLLECT DATA

I refer to your request to conduct research at the University of Nairobi for your research project titled: **"Information Access Framework for Improving Utilization of Information in Digital Resource Platforms by Academic Staff in Selected Public Universities in Kenya"**

I write to inform you that your request has been approved.

You are however required to share the findings of your study with the University of Nairobi by depositing a copy of your findings with the Director Library & Information Services on completion of your study.

Yours sincerely,

FOR: PROF. M. JESANG HUTCHINSON
ASSOCIATE VICE-CHANCELLOR (AG.)
(RESEARCH, INNOVATION AND ENTERPRISE)
AND
PROFESSOR OF HORTICULTURE

Copy to: Director, Library and Information Services

SKB/jks

APPENDIX X: AUTHORIZATION LETTER FOR DATA COLLECTION FROM MOI UNIVERSITY

MOI UNIVERSITY

OFFICE OF THE DEPUTY VICE CHANCELLOR
(ACADEMICS, RESEARCH AND EXTENSION)

Tel: (053) 43355
(053) 43620
Fax: (053) 43412
Email: dvc_are@mu.ac.ke or dvcaremoi@gmail.com

P.O. Box 3900
Eldoret - 30100
Kenya.

REF: MU/DVC/REP/27B

Date: 7th February, 2022

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: PERMISSION TO CARRY OUT RESEARCH – ANNE NAKHUMICHA TENYA

The above subject matter refers.

Ms. Anne Nakhumicha Tenya who is a Ph.D. student at Kisii University has applied for authority to carry out research at Moi University. We would be grateful if she is permitted to conduct her research on ***"Information Access Framework for Improving Utilisation in Digital Resource Platforms by Academic Staff in Selected Public Universities in Kenya."***

After the completion of the research, a complete report both on hard and soft copy will be handed over to the office of Deputy Vice-Chancellor, Academics, Research & Extension.

Any assistance accorded to her will be highly appreciated.

Thank you.

Yours faithfully,

PROF. I. N. KIMENCHI, Ph.D.
DEPUTY VICE-CHANCELLOR
(ACADEMICS, RESEARCH & EXTENSION)

APPENDIX XI: AUTHORIZATION LETTER FOR DATA COLLECTION FROM EGERTON UNIVERSITY

EGERTON UNIVERSITY
P.O. Box 536-20115
Egerton, Kenya
Tel: (051) 2217806
E-mail: dvcaa@egerton.ac.ke

OFFICE OF THE DEPUTY VICE - CHANCELLOR
(ACADEMIC AFFAIRS)

EU/AA/DVC/CORR/128 **11th April, 2022**

Ann Nakhumicha Tenya,
P.O Box 377-20100,
NAKURU.

Email: annetenya@gmail.com

RE: PERMISSION TO COLLECT DATA

Rference is made to your letter dated 1st April, 2022 on the above subject.

Permission is hereby granted for you to collect data from Egerton University Librariran, Librarians in charge of e-content and academic staff for your research topic entitled "**Information Acess Framework for Improving Utilisation in Digital Resource Platforms by Academic Staff in Selected Public Universities in Kenya".**

Kindly note that the data collected is purely for academic purposes and must be treated with utmost confidentiality.

Yours sincerely,

Prof. Bernard O. Aduda, PhD
DEPUTY VICE CHANCELLOR (ACADEMIC AFFAIRS)

DEPUTY VICE CHANCELLOR
EGERTON UNIVERSITY
P.O. BOX 536,
EGERTON - KENYA
ACADEMIC AFFAIRS

BOA/ejc

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APPENDIX XII: AUTHORIZATION LETTER FOR DATA COLLECTION FROM KENYATTA UNIVERSITY

KENYATTA UNIVERSITY

OFFICE OF THE DEPUTY VICE-CHANCELLOR RESEARCH, INNOVATION AND OUTREACH

Office Phone: (+254-20) 8703026
Office Cell: +254 772 296748
Website: www.ku.ac.ke

P. O. Box 43844-00100
Nairobi, Kenya
Email: dvc-rio@ku.ac.ke

Ref: KU/DVCR/RCR/VOL. 3/337 **Date:** 12th April, 2022

Ms. Anne Nakhumicha Tenya
Kisii University
Kisii

Dear Ms. Tenya,

RE: REQUEST TO COLLECT RESEARCH DATA AT KENYATTA UNIVERSITY

This is in reference to your letter dated 29th March, 2022 requesting for authorization to collect research data at Kenyatta University on the topic **"Information access framework for improving utilization in digital resource platform by academic staff in selected public universities in Kenya"** towards a PhD in Information Technology of Kisii University.

I am pleased to inform you that your request to collect data has been approved. It is noted that your data will be collected from academic members of staff and librarians. It is further noted that the data will solely be used for academic purposes and will be treated with utmost confidentiality.

The University requires that, upon completion of your research you submit a hard copy of your report to the Deputy Vice-Chancellor Research, Innovation and Outreach who shall forward it to the University Library. Kindly therefore complete and sign the attached form RIO 3 and return it to my office prior to the commencement of collection of data.

Yours sincerely,

Prof. Vincent Onywera Ph.D., ISAK 2
Ag. Deputy Vice-Chancellor Research, Innovation and Outreach

cc: Vice-Chancellor
DVC, Academic
Chief University Librarian

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APPENDIX XIII: PLAGIARISM REPORT

ACCESS AND UTILIZATION OF INFORMATION IN DIGITAL RESOURCE PLATFORMS FOR TEACHING AND RESEARCH BY ACADEMIC STAFF IN SELECTED PUBLIC UNIVERSITIES, KENYA

ORIGINALITY REPORT

18%	16%	5%	4%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	www.scirp.org Internet Source	6%
2	library.kisiiuniversity.ac.ke:8080 Internet Source	2%
3	Submitted to University of South Africa (UNISA) Student Paper	1%
4	ir.mu.ac.ke:8080 Internet Source	1%
5	digitalcommons.unl.edu Internet Source	<1%
6	journals.ijcab.org Internet Source	<1%
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8	erepository.uonbi.ac.ke Internet Source	<1%