

**APPLICATION OF DIGITAL LITERACY SKILLS BY POSTGRADUATE
STUDENTS TO ACCESS AND USE ELECTRONIC RESOURCES AT
STRATHMORE UNIVERSITY LIBRARY, KENYA**

BY

MASAI ALFRED KIPROP

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS OF
SCIENCE IN LIBRARY AND INFORMATION STUDIES, DEPARTMENT
OF LIBRARY, RECORDS MANAGEMENT AND INFORMATION
STUDIES, SCHOOL OF INFORMATION SCIENCES**

MOI UNIVERSITY

2024

DECLARATION

Declaration by Candidate

This research thesis is my original work and has not been presented for an award for a degree in any other university. No part of this thesis may be reproduced without the permission of the authors and/or Moi University.

Signature _____ Date: _____

ALFRED KIPROP MASAI

IS/MSCLIS/27/13

Declaration by the Supervisors

We confirm that the work reported in this thesis was carried out under our supervision and has been submitted with our approval as the University supervisors.

Signature _____ Date: _____

Dr. Emily Bosire

Department of Library, Records Management and Information Studies

Moi University, Eldoret, Kenya.

Signature: _____ Date: _____

Dr. Emily Ngeno

Department of Library, Records Management and Information Studies

Moi University, Eldoret, Kenya.

DEDICATION

I dedicate this work to my son Manuel and daughter Talia for being patient with me as I spent many hours writing this thesis; my parents Isaac Kiptabut and Sally Masai for their financial for ensuring that my financial needs were taken care of; and to my brother Andrew not forgetting my sisters Felicia, Winnie and Daisy for their unwavering encouragement in undertaking my studies.

ACKNOWLEDGEMENT

I sincerely thank the many people and institutions that made this study possible through their contribution, support, comments, encouragement and guidance. I feel obliged to express my gratitude to my supervisors; Dr. Emily Bosire and Dr. Emily Ng'eno, for their contribution towards the development of this research thesis. Their support, guidance and positive criticism assisted me to develop this thesis. Thanks to my classmates for always encouraging me to push harder. Finally, special thanks to my family especially my dear uncle Philip Masai for his endless moral and financial support during this period.

ABSTRACT

Digital literacy skills are vital in enhancing confidence in access and use of electronic resources in academic libraries and easing the difficulties associated with their usage. Postgraduate students are necessitated to acquire digital literacy skills as this would guarantee their adequate access and use of electronic resources for learning, course work, teaching and research work. The study aimed to investigate the application of digital literacy skills on access and use of electronic resources by postgraduate students at Strathmore University with a view to proposing interventions to improve digital literacy skills. The objectives of the study were to: investigate the level of digital literacy skills on access and use of electronic resources by postgraduate students; examine the application of ICTs and digital literacy skills in facilitating adequate access and use of electronic resources; find out the type of digital literacy training programmes in place for postgraduate students in facilitating access and use of electronic resources; identify challenges faced by postgraduate students concerning digital literacy skills on access and use of electronic resources and suggest ways of improving digital literacy skills to facilitate access and use of electronic resources. The study was underpinned by the Student's Digital Literacy and the Horizontal Pyramid Models. A mixed-method approach was adopted taking on board survey design applied within a single case study in line with concurrent parallel design. Quantitative data was collected from postgraduate students and qualitative data from library staff. The sample consisted of 184 postgraduate students randomly sampled from 776 postgraduate students. The 30% rule according to Neuman was used. Five library staff were purposively sampled. Qualitative data were analyzed using content analysis while quantitative data were analyzed using frequency distribution and cross tabulation methods. Tables, charts, graphs and thematic discussions were used to present the data. The findings of the study revealed that postgraduate students possess different levels of digital literacy skills needed to access and use electronic resources; 79 (43%) of postgraduates and library staff digital literacy skills were inadequate and therefore limits access to and utilization of electronic resources; although ICT and digital literacy skills supported expanded access to electronic resources databases and improved learning opportunities at SUL, 134(72.9%) of the postgraduate students stated that ICT facilities were inadequate; the library has an ICT and collection development policy but suffers from a lack or absence of an electronic resources policy that underpins digital literacy skills; and despite digital literacy programmes being in place 90(48.9%) of postgraduate students indicated that the training was inadequate resulting to insufficient levels of digital literacy skills among others. The study concludes that the digital literacy skills of postgraduate students at Strathmore University library are inadequate and this limits the utilization of electronic resources. The study recommends regular digital literacy and electronic resources training to improve the level of digital literacy skills of postgraduate students; increase and improvement of ICT facilities; establishment of an electronic resources policy; reviewing of ICT policies to underpin digital literacy skills and the use of electronic resources; and regular reskilling and upskilling of the library staff on digital literacy. Facilitate adequate access and use of electronic resources by facilitating postgraduate students in carrying out their academic tasks with ease.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	xii
LIST OF FIGURES.....	xiii
ABBREVIATIONS AND ACRONYMS	xiv
CHAPTER ONE.....	1
INTRODUCTION AND BACKGROUND TO THE STUDY	1
1.1 Introduction	1
1.1.1 Contextualization of Digital Literacy.....	3
1.1.1.1 Kenyan Perspectives of Digital Literacy.....	5
1.2 Strathmore University (SU)	9
1.2.1 Strathmore University Education Programmes for Postgraduates	10
1.2.2 Strathmore University Library (SUL)	11
1.2.2.1 Strathmore University Library Services.....	13
1.2.2.2 Information Literacy and Digital Literacy Programme at Strathmore University Library.....	13
1.2.3 SU Library organization structure	15
1.3 Statement of the Problem	16
1.4 Aim.....	19
1.5 Objectives.....	19
1.6 Research Questions	20
1.7 Assumption of the Study	20
1.8 Significance of the Study	21
1.8.1 Theoretical Significance.....	21
1.8.2 Pragmatic Significance.....	22
1.8.3 Policy Significance.....	22
1.9 Scope and Limitation of the Study	23
1.9.1 Scope of the Study.....	23
1.9.2 Limitations of the Study	23
1.10 Definition of Operational Terms and Concepts.....	24
1.11 Structure of the Thesis.....	25
1.12 Chapter Summary.....	26

CHAPTER TWO.....	28
LITERATURE REVIEW	28
2.1 Introduction	28
2.2 Theoretical Framework	29
2.2.1 Theories Underpinning the Study.....	29
2.2.1.1 Model of Student’s Digital Literacies by Beetham and Sharpe (2011).....	30
2.2.1.2 The Horizontal Pyramid Model Advanced (Ndubisi and Jantan, 2003)	38
2.3 Themes Relevant to the Study.....	45
2.3.1 Concept of Digital Literacy Skills.....	45
2.3.2 Application of ICT and Digital Literacy Skills on Access and Use of Electronic Resources	49
2.3.3 Access and Use of Electronic Resources	52
2.3.4 Digital Literacy Training Programmes for Access and Use of Electronic Resources.....	55
2.3.5 Challenges facing Digital Literacy on Access and Use of Electronic Resources by Students in Higher Institutions of Learning	57
2.3.6 Measures to Enhancing Digital Literacy Skills to Support Access and Use of Electronic Resources	60
2.4 Chapter Summary.....	62
CHAPTER THREE	63
RESEARCH METHODOLOGY.....	63
3.1 Introduction	63
3.2 Research Methods	63
3.2.1 Mixed method	64
3.3 Research Design.....	67
3.4 Population of the Study	68
3.5 Sampling Procedure	71
3.5.1 Stratified Sampling.....	72
3.5.2 Simple Random Sampling.....	72
3.5.3 Purposive Sampling.....	73
3.6 Sample Size	73
3.7 Data Collection Instrument	75
3.7.1 Interview	76
3.7.2 Administration of Questionnaires	77
3.8 Data Collection Procedures.....	78
3.9 Validity and Reliability of the Data Collection Instruments	78
3.9.1 Validity.....	79
3.9.2 Reliability	80

3.10 Data Presentation and Analysis of Findings.....	82
3.11 Ethical Consideration	84
3.12 Chapter Summary.....	85
CHAPTER FOUR.....	86
DATA PRESENTATION AND ANALYSIS	86
4.1 Introduction	86
4.2 Response Rate	87
4.3 Demographics Characteristics of Respondents	89
4.3.1 Postgraduate Students Demographics Characteristics.....	90
4.3.1.1 Gender	90
4.3.1.2 Age of Postgraduate Students.....	90
4.3.1.3 Level of Education	91
4.3.1.4 Year of Study	91
4.3.1.5 Nature of Study	92
4.3.1.6 Duration of Usage of the Library by Postgraduate Students.....	93
4.3.2 Key Informants (Library Staff) Demographics Characteristics	93
4.3.2.1 Job-Status Position of Key Informants (Library Staff)	93
4.3.2.2 Work Experience of Library Staff.....	94
4.3.2.3 Highest Qualification of Library Staff	94
4.4 The level of digital literacy skills on access and use of electronic resources by postgraduate students.....	94
4.4.1 Level of Digital Literacy Skills of Postgraduate Students	94
4.4.2 Digital Literacy Skills Possessed by Postgraduate Students that Assist in Access and Use of Electronic Resources	96
4.4.3 Adequacy of Digital Literacy Skills in terms of Access and Use of Electronic Resources	99
4.4.4 Effect of Digital Literacy Skills on Access and Use of Electronic Resources on Academic Performance	101
4.5 Application of ICT and Digital Literacy Skills in Facilitating Adequate Access and Use of Electronic Resources	102
4.5.1 Availability of ICTs Facilities to Postgraduate Students	103
4.5.2 Adequacy of the Available ICT Facilities in the Library	104
4.5.3 Use of ICTs to Facilitating Access and Use of Electronic Resources.....	105
4.5.4 Rating the Digital Literacy Skills upon the Use ICTs to Access and Use Electronic Resources	107
4.5.5 Availability of Electronic Resources in the Library that can be accessed through ICT Facilities	108

4.5.6 How Electronic Resources are Accessed by Postgraduate Students	109
4.5.7 Purpose for Using Electronic Resources	111
4.5.8 ICT Policy in Place to Promote Access and Use of Electronic Resources.....	112
4.6 Digital Literacy Training Programmes for Postgraduate Students to Facilitating Access and Use of Electronic Resources	113
4.6.1 Availability or Absence of Digital Literacy Training Programmes for Postgraduate Students to Access and Use Electronic Resources	113
4.6.2 Digital Literacy Training Needs of Postgraduate Students of Strathmore University	118
4.6.3 Digital Literacy Training Setup.....	120
4.6.4 Adequacy of the Digital Literacy Training Program on the Use of Electronic Resources	120
4.6.5 Training of Digital Literacy and Access and Use of Electronic Resources	121
4.7 Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library.....	122
4.8 Measures to Improve Digital Literacy Skills to facilitate Access and Use of Electronic Resources.....	125
4.8.1 Appropriate Digital Literacy Training and programmes for Library Users	125
4.8.2 Creating Awareness and Advocacy Programmes	126
4.8.3 Improve Computer Speed and Internet Connectivity	126
4.8.4 Subscription for Electronic Resources with Restricted Access and Addition of More Relevant Electronic Resources Database	126
4.9 Chapter Summary.....	128
CHAPTER FIVE.....	129
DISCUSSION AND INTERPRETATION OF FINDINGS	129
5.1 Introduction	129
5.2 Background Information of the Respondents.....	129
5.3 Level of Digital Literacy Skills of Postgraduate Students	131
5.3.1 Digital Literacy Skills Possessed by Postgraduate Students and Library Staff that Assist in Access and Use of Electronic Resources.....	133
5.3.2 Adequacy of Digital Literacy Skills on Access and Use of Electronic Resources....	136
5.4 Application of ICT and Digital Literacy Skills in Facilitating Adequate Access and Use of Electronic Resources	138
5.4.1 Availability of ICTs Facilities to Postgraduate Students	138
5.4.2 Adequacy of the Available ICT Facilities in the Library	139
5.4.3 Use of ICTs to Facilitating Access and Use of Electronic Resources.....	140
5.4.4 Rating the Digital Literacy Skills upon the Use ICTs to Access and Use Electronic Resources	141

5.4.5 Availability of Electronic Resources in the Library that can be accessed through ICT Facilities	143
5.4.6 How Electronic Resources are Accessed by Postgraduate Students	144
5.4.7 Purpose for Using Electronic Resources	145
5.4.8 ICT Policy in Place to Promote Access and Use of Electronic Resources.....	146
5.5 Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources	148
5.5.1 Availability or Absence of Digital Literacy Training Programmes for Postgraduate Students to Access and Use Electronic Resources	148
5.5.2 Digital Literacy Training Needs of Postgraduate Students of Strathmore University	151
5.5.3 Digital Literacy Training Setup.....	153
5.5.4 Adequacy of the Digital Literacy Training Program on the Use of Electronic Resources	153
5.5.5 Training of Digital Literacy and Access and Use of Electronic Resources	154
5.6 Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library.....	155
5.7 Measures to Improve Digital Literacy Skills to facilitate Access and Use of Electronic Resources.....	157
5.8 Chapter Summary.....	159
CHAPTER SIX.....	160
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS	160
6.1 Introduction	160
6.2 Summary of the Findings	160
6.2.1 Background information of the respondents	160
6.2.2 Level of Digital Literacy Skills of Postgraduate Students	161
6.2.3 Application of ICT and Digital Literacy Skills in Facilitating Adequate Access and Use of Electronic Resources	162
6.2.4 Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources.....	165
6.2.5 Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library	167
6.3 Conclusion.....	168
6.4 Recommendations	169
6.4.1 Level of Digital Literacy Skills of Postgraduate Students	170
6.4.2 Application of ICT and Digital Literacy Skills in Facilitating Adequate Access and Use of Electronic Resources	171

6.4.3 Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources.....	173
6.5 Contribution and Originality of the Study.....	175
6.6 Suggestion for Further Research.....	177
REFERENCES.....	179
APPENDICES.....	194
Appendix I: Pre-Test Check List for Questionnaire and Interview Schedule	194
Appendix II: Questionnaire for Postgraduate Students	195
Appendix III: Interview.....	202
Appendix IV: Authority from NACOSTI to undertake research	206
Appendix V: Ethical Clearance (Institutional Research and Ethics Committee)	207
Appendix VI: Authority letter from Strathmore University	208
Appendix VII: Request to Conduct Research	209

LIST OF TABLES

Table 3.1: Target Population of Key Informants	69
Table 3.2: Target Population of Postgraduates at Strathmore University per Programme	70
Table 3.3: Sample Size of Postgraduates at Strathmore University per Programme	75
Table 3.4: Sample Size for Library Staff who are the Key Informants.....	75
Table 3.5: Mapping Research Questions to Sources of Data and Data Analysis Strategy.....	83
Table 4.1: Summary of Response Rate Respondent	88
Table 4.2: A Response Rate of Postgraduate Students and Library Staff at Strathmore University	89
Table 4.3: Level of Education Currently Being Undertaken by Postgraduate Students	91
Table 4.4: Duration of usage of the library by Postgraduate Students.....	93
Table 4.5: Current Job Status of Respondents	93
Table 4.6: Digital Literacy Skills Possessed by Postgraduate Students.....	97
Table 4.7: Availability of ICT facilities to postgraduate students.....	103
Table 4.8: Adequacy of the available ICT facilities and electronic resources subscribed by library	104
Table 4.9: Use of ICT to Facilitating Access and Use of Electronic Resources	106
Table 4.10: Electronic resources available in the library	108
Table 4.11: Means of Accessing Electronic Resources by Postgraduate Students	110
Table 4.12: Purpose for Using Electronic Resources.....	111
Table 4.13: Digital Literacy Training Needs of Postgraduate Students of Strathmore University	119
Table 4.14: Digital Literacy Training Setup	120
Table 4.15: Training of Digital Literacy and Access and Use of Electronic Resources	122
Table 4.16: Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library.....	123

LIST OF FIGURES

Figure 1.1: Strathmore University Library Organizational Structure	15
Figure 2.1: Model of Students' Digital Literacy	31
Figure 2.2: The "Horizontal Pyramid model"	39
Figure 2.3: Triangulation of model of students' digital literacies and the Horizontal Pyramid Model	43
Figure 4.1: Age of Postgraduate Students	90
Figure 4.2: Year of Study	92
Figure 4.3: Nature of Study	92
Figure 4.4: Level of Digital Literacy Skills on Access and Use of Electronic Resources by Postgraduate Students of Strathmore University.....	95
Figure 4.5: Adequacy of Digital Literacy Skills of Postgraduate Students on Access and Use of Electronic Resources	100
Figure 4.6: Effect of Digital Literacy Skills on Access and Use of Electronic_Resources on Academic Performance	102
Figure 4.7: Rating the Digital Literacy Skills upon the Use ICTs to Access and Use Electronic Resources	107
Figure 4.8: Availability or absences of digital literacy training programmes for postgraduate students to access and use electronic resources.....	114
Figure 4.9: Training on the use of Electronic Resources	115
Figure 4.10: Application of the Skills Acquired from Digital Literacy and Electronic Training Program for Access and Use of Electronic Resources	117
Figure 4.11: Adequacy of Digital Literacy Training Program Using Electronic_Resources	121

ABBREVIATIONS AND ACRONYMS

CD-ROM	: Compact Disc Read Only Memory
DLP	: Digital Literacy Programme
E-books	: Electronic books
E-eruope	: Electronic Europe
E-journals	: Electronic journals
E-newspapers	: Electronic newspapers
EU	: European Union
GOK	: Government of Kenya
ICT	: Information Communication Technology:
IL	: Information Literacy
IT	: Information Technology
KLISC	: Kenya Library and Information Services Consortium
MAPE	: Master in Applied Philosophy and Ethics
MCOM	: Masters of Commerce
MEM	: Masters in Education Management
MEPA	: Master in Education Practice for Academics
MSC. CIS	: Masters of Science in Computer-Based Information Systems
MSc. IT	: Masters of Science in Information Technology
MSc. SS	: Master of Science in Statistical Science
MSc.B	: Masters of Science in Biomathematics
MSc.M	: Masters of Science in Mathematical
OPAC	: Online Public Access Catalogue
SRGS	: School of Research and Graduate Studies
SU	: Strathmore University
SUL	: Strathmore University Library

TAM	: Technology Acceptance Model
TRA	: Theory of Reasoned Action
UNESCO	: United Nations Educational, Scientific and Cultural Organization.
WWW	: World Wide Web

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

This chapter introduces and provides the background to the study. It presents the statement of the problem, general and specific objectives, research questions, and assumptions of the study. The significance of the study, scope and its limitations, operational definitions of terms and concepts used in the study are also presented.

The 21st century has experienced a remarkable advancement in ICTs and the growth of electronic resources, which have tremendously changed students' and researchers' information-seeking attitudes globally. Thus, the electronic resources have been identified as significant sources of information dissemination in universities, especially for researchers (Sejane, 2017). The provision of electronic resources in higher learning institutions is seen as a new way of gaining global access to research information (Alqudah & Muradkhanli, 2021). These electronic resources have gone a long way in enhancing the availability of information resources to postgraduate students who need it to write seminar papers, provide information for their assignments, and other research activities, which is an essential component of postgraduate studies (Ismail et al., 2011).

Digital literacy skills are vital in enhancing confidence in accessing and using electronic resource databases in academic libraries and easing the difficulties associated with their usage, which have become a preference for successful learning and research in institutions of learning globally (Owansuan & Soyemi, 2022). The University is the birthplace of life-changing ideas aimed to benefit the rest of the universe. Prominent university community members are postgraduate students burdened with the numerous coursework related to their disciplines. The heavy

workload makes the students search for information in electronic database resources in the university libraries. To benefit from their search, the students require digital literacy skills. Consequently, every postgraduate student who intends to be an effective user of electronic resources must possess strong information literacy skills (Ugwulebo & Okuonghae, 2021).

Different scholars have also defined digital literacy in different ways. Yo (2021) defines digital literacy as the availability of knowledge and skills necessary for the student's safe and effective use of digital technologies and Internet resources. Mirzaei and Sarrafzadeh (2020), state that digital literacy is a set of skills that enable people to use digital space to succeed in their personal, academic, and professional lives. From the foregoing definitions, it is clear that digital literacy means using digital technology, communication devices and network in digital environments to live life efficiently. The researcher believes that through digital literacy skills, postgraduates of Strathmore University will take advantage of emerging opportunities associated with digital technologies to access and use the vast electronic resources subscribed by the University.

Tyckoson (2011) believes that libraries that fail to adopt appropriate information technology in their services may cease to function and perhaps, close down. Essentially, ICTs and the digital literacy skills of postgraduate students are the standpoints that provide access to electronic resources. Academic libraries promote modern teaching, learning, and research through ICT and subscriptions to electronic resource databases. Academic libraries are central in higher educational systems, assisting in improving learning and disseminating knowledge to meet the information needs of the universities and their communities through provision of timely information.

To this end, the tremendous growth in electronic resources, availability of technology and practical digital literacy skills training have changed the education and information industry scenario. Therefore, postgraduates need to be digitally and information literate, as this would guarantee their adequate access and use of electronic resources. Accordingly, the postgraduate students must know not only about the technology but the domain of the application and the skills needed to determine what they need and how they use it. Therefore, it is against this backdrop that this study was designed to investigate digital literacy skills on access and use of electronic resources by postgraduate students at Strathmore University, Kenya.

1.1.1 Contextualization of Digital Literacy

Digital literacy is increasingly recognized worldwide as a remedy for functioning effectively in an emerging electronic environment (Mutula & Wamukoya, 2007). According to Laanpere (2019), the importance of digital literacy is evidenced by the many national and regional efforts to develop and implement digital literacy frameworks and strategic plans to bolster citizens' digital literacy. With the advent of new technology globally, most countries have adopted digital literacy projects intending to enhance the students' digital literacy skills in a learning institution, making teaching programs interesting as they evolve from teacher-centered to student-centered (Kainth & Kaur, 2010).

Various ongoing initiatives (Law et al., 2018; Machin-Mastromatteo, 2021; Wei, 2022; Eden et al., 2024) worldwide have been established to support digital literacy programs to facilitate access to electronic resources by academician and students in institutions of higher learning. According to a report by the European Commission (2022), the implementation of digital literacy initiatives has significantly contributed to empowering students with the necessary digital literacy skills to navigate the

digital landscape effectively to access and use electronic resources. Furthermore, research conducted by Smith et al. (2021) emphasized the positive impact of widespread internet access in educational institutions, citing improved learning outcomes and increased engagement among students and academic staff globally.

In terms of specific efforts within the European Union, the Digital Education Action Plan (2021) unveiled by the European Commission focuses on promoting digital literacy skills and competence among academicians and students. This initiative emphasizes the utilization of structural funds to address the digital divide and provide equitable access to online resources. Moreover, the European Union's Erasmus+ program has allocated substantial funding for projects aimed at enhancing digital literacy in higher education institutions. These projects encompass teacher training programs, development of digital learning materials, and the establishment of digital competence frameworks (European Commission, 2023).

Such initiatives promises that each member country was required to ensure that all universities offered online access to information for students, researchers, and academic staff to maximize the quality and efficiency of the learning process and other academic activities. Further, the EU member countries have been implementing a diploma course in basic digital literacy skills to stimulate the uptake of certified training and its recognition, promoting a network of learning and training centres for demand-driven information and ICT. With such efforts, postgraduate students in the European Union member states will be equipped with digital literacy skills and this will go a long way in enabling them to access and use electronic resources needed for writing seminar papers, assignments and other research related activities, as well as improve their employability (Europe Commission, 2004).

From the foregoing, the Australia Education Network School Advisory Group of 2000 has developed a school education plan, which among other things, seeks to enable all school leavers to be confident, creative, and productive users of new technology through digital literacy programmes. The intention was to make all schools in Australia seek to integrate ICT into their operations through the attainment of digital literacy skills to improve their business practices (Australia Education Network, 2000). With such efforts, postgraduates in Australian institutions of higher learning were to gain an advantage in accessing several electronic resource databases that otherwise would not have been possible.

Meanwhile, Hennesy et al. (2010) point out that ICT integration in Sub-Saharan Africa depends on the availability of resources: physical resources such as hardware, electricity, modern buildings, and human resources such as teacher competence and IT expertise, and experience as well as knowledge. Disappointingly, the integration of technology in learning institutions in East Africa has been a process that has been slow over the years albeit the conditions have improved recently, with learning institutions progressively acquiring computers and subscribing to electronic resources for academic purposes. Notably, the Internet networking has improved as students are becoming more enthusiastic about using computers and the Internet to access online resources despite inadequate infrastructure (Olakulehin, 2007).

1.1.1.1 Kenyan Perspectives of Digital Literacy

Over the past years, the Kenyan Government has shown a strong commitment to harnessing the power of information and communication technologies (ICTs) to improve the effectiveness of teaching and learning in educational institutions. In Kenya, digital literacy has become increasingly important as universities strive to adapt rapidly to the fast-changing world of technology. The Government of Kenya

has prioritized ICT integration as part of its Kenya Vision 2030 initiative, recognizing universities as critical in developing a digitally literate workforce capable of driving research and innovation (Wambui et al., 2022). The Digital Literacy Program is a result of the Kenyan vision 2030, which aims to integrate each student into a digital education system (Tarus et al., 2015).

Kamau (2020) notes that digital literacy programs have been beneficial to universities in the following ways: firstly, they have enabled human development and bridged the digital divide; hence students are suitable for the global economy and are updated, secondly, access to quality open and equitable education resources of information is made available which has fostered information sharing and exchange, thirdly, lecturers are readier to invest in innovative teaching ideas that improve on the traditional teaching methods and Fourthly, most notable characteristic is the flexibility whereby learning can take place from any location in the country where there is internet connectivity Kamau (2020).

Since then, the expansion of postgraduates training programs at universities in Kenya has made digital literacy an integral aspect of the curriculum, especially for modern teaching, learning, research related activities and online resource access (Sawe, 2017). The integration of digital literacy into postgraduate coursework differs widely among universities. While some institutions provide cutting-edge ICT programs, others face infrastructural limitations, preventing students from accessing the ICTs and electronic resources essential for their academic development.

Over the past years, the Kenyan Government has shown a strong commitment to harnessing the power of information and communication technologies (ICTs) to improve the effectiveness of teaching and learning in educational institutions. This

focus on ICT integration that has been driven by the introduction of laptop computers to primary schools that are also in line with the recommendations of the Kenyan ICT policy framework that advocated for full integration of ICT in all educational institutions in Kenya by the use of appropriate digital equipment. (ICT Authority, 2017).

Kenya stands out as one of the prominent African countries that have wholeheartedly embraced the Digital Literacy Programme (DLP), garnering recognition under the brand name "DigiSchool" (Ogolla, 2018). This initiative reflects the government's visionary approach to empower students with essential digital literacy skills required to thrive in the contemporary digital landscape. The Digital Literacy Programme in Kenya was introduced with the aim of equipping pupils with the necessary tools and knowledge to navigate the digital era. Under this program, students gain access to various technological resources, including computers, tablets, and internet connectivity, enabling them to acquire digital literacy skills from an early age (ICT Authority, 2017). Its objectives are to:

- Entrench ICT in the teaching and learning process;
- Equip public primary schools with appropriate ICT infrastructure to support the teaching, learning, and development of capacity of teachers, education managers, and other stakeholders with necessary ICT skills;
- Enable development and accreditation of appropriate digital content to enhance the acquisition of 21st-century skills;
- Promote universal access to ICT tools in primary schools; and
- Integrate sustainable and affordable digital programs in the Kenyan education system.

ICT implementation in Kenya's public primary schools is an everyday occurrence, done in small magnitudes and investigational. Nevertheless, it has been commonly recognized that the application of technology in schools has advanced in a closely similar manner, ranging from developing policies, achieving elementary computer expertise, teaching and learning using a computer, exchanging information and inquiry, to application in each subject. The Government of Kenya (GOK) acknowledges that if technology is integrated into primary schools, knowledge will be constructed, and information will be shared and communicated across school communities (Republic of Kenya, 2015).

The Government of Kenya through Sessional Paper no. 1 of 2005 observed that technology has a specific part to play in schools and if put into proper use, it can advantage schools as well as communities. It was also observed that technology would offer novel innovations for learning by enabling communication and collaboration between teachers and learners (Republic of Kenya, 2005). Since then, the GOK developed a nationwide policy on technology in education in the year 2006, whose vision was:

"A prosperous ICT-Driven Kenya society" and whose mission was "To improve the livelihood of Kenyans by ensuring the availability of efficient, accessible, reliable and affordable ICT services" (Republic of Kenya, 2005).

Highlights in the policy were that the GOK would inspire schools to assimilate and apply technology so as to enhance the quality of learning. Most schools have not yet applied school policies on technology usage, mainly due to inadequate infrastructure and school leaders and teachers who lack technology know-how in as much as the modern worldwide technology emphasizes digitizing learning institutions. Despite the obvious payback of using technology in schools, studies have shown that many

schools have not yet implemented it, preventing the school community and the learners from exploiting technology possibilities (Manduku et al., 2012).

1.2 Strathmore University (SU)

This is one of the top ranked private universities in Kenya. Strathmore University was established in 2002 by Universities Act (CAP 210B). It offers both undergraduate and postgraduate programmes. For several years 'web metrics has listed SU among the top 200 universities in Africa. It became the first amongst all the private universities in Kenya, 8th amongst all the universities in Kenya and 168th and 4183 position in Africa and the whole world respectively (Webometrics, 2017).

The University, at present, has nine teaching schools serving a student population of over 5,000. With this growth, Strathmore University is committed to providing quality education to its stakeholders. This can only be achieved once students' information and digital literacy skills meet the set standards. The University's library has been entrusted to provide digital literacy skills to library users (Strathmore University Library Annual Report, 2018).

The vision of Strathmore University is to be a center of academic and professional excellence that provides all-around education in an atmosphere of freedom and responsibility. Similarly, the mission is to dedicate ourselves to the advancement of education through teaching, scholarship and service to society by providing an all-round education in an atmosphere of freedom and responsibility, creating a culture of continuous improvement, fostering high moral standards and developing a spirit of service and respect for others.

Strathmore University was chosen for the study due to its strong reputation for integrating technology into teaching, learning and research, making it one of East

Africa's leading private universities with a strong focus on information technology. Further, SU has emphasized on digital literacy which has spurred innovations in areas such as cloud computing, big data, open access to online information and artificial intelligence thus making SU a choice of the study. SU librarians have a clear focus and resolve to equipping students with the skills needed to navigate, critically evaluate, and effectively use digital information in an increasingly complex and online academic environment. This shift reflects the growing recognition of the critical role digital literacy plays in academic success and lifelong learning.

This reputation has positioned Strathmore University as an ideal setting to investigate how postgraduate students apply digital literacy in their academic work and research. Strathmore University offers a diverse range of postgraduate programs where students are engaged in learning and doing research that requires access and utilization of electronic resources. SUL is well equipped with a vast collection of electronic resources, including online databases, journals and e-books, which postgraduate students need to navigate and utilize, making it a relevant location for such a study (Strathmore University Library Annual Report, 2018).

1.2.1 Strathmore University Education Programmes for Postgraduates

The School of Research and Graduate Studies (SRGS) provides a stimulating research environment and continuous support to researchers' and students' contributions to enhancing national, regional, and international leadership in research and graduate education. The SRGS coordinates and facilitates postgraduate students and activities at the University. Currently, six schools are offering different postgraduate programs, namely: Master of Commerce (MCOM); Master of Science in Information Technology (MSc. IT); Master of Science in Computer-Based Information Systems (MSC. CIS); Masters degree in Education Management

(MEM); Masters in Applied Philosophy and Ethics (MAPE); Masters in Education Practice for Academics (MEPA); Master of Science in Biomathematics (MSc.B), Master of Science in Statistical Science (MSc. SS); Master of Science in Mathematical Finance (MSc.M) and various Doctor of Philosophy (PhD) programmes.

In the 2018/2019 academic year, there were 776 postgraduate students studying in different programs across these schools and faculties as indicated: Faculty of Information Technology, Strathmore Business School, School of Law, School of Humanities and Social Sciences, School of Graduates, and School of Accountancy. The University offers the following Masters and Ph.D. degree programs: Masters of Arts in Philosophy and Ethics, Masters of Business Administration, Masters of Commerce, Masters of Science in Computer-Based Information Systems, Masters of Science in Education Management, and Masters of Science in Information Technology.

1.2.2 Strathmore University Library (SUL)

The Strathmore University Library is a modern, state-of-the-art library providing a full range of high-quality services based on print and electronic resources to university students, academic staff, alumni, and external readers from other universities in Kenya and abroad. Being at the service of the University, the library aims to support scientific research, quality teaching, and community service by building up a qualitative collection of printed and non-printed information resources, equipping itself with appropriate Information Communication Technologies for the efficient and effective information services delivery.

The library is committed to collecting information resources in all formats and providing quality services. The library consists of information services (circulation, special collections, periodicals, audiovisual and electronic services department), technical services, and information literacy. The Information Literacy Department is in charge of all information literacy training. Information literacy has been embedded with the communication skills units as a course taught at the University. Library users are introduced to information literacy concepts, research skills on various databases, locating information resources, evaluating the information sources, and using them effectively and ethically.

The vision of Strathmore University Library is to become a world-class scholarly information service provider and a primary partner in teaching, learning, and research at the University. Similarly, the mission of the library is to bring together quality resources, knowledgeable staff, and leading-edge technology to advance scholarly inquiry, research, and life-long learning, fostering human formation and service to society.

In this regard, the library plays an indispensable role in line with the SU vision and mission (Strathmore University Library Annual Report, 2018) by:

- i. Supporting the teaching and research needs of the University;
- ii. Building a dynamic collection that meets present and future needs;
- iii. Providing literal materials in the area of immediate concern and growing importance;
- iv. Disseminating knowledge and information through Current Awareness Services, reference, and information services;

- v. Providing complete bibliographic information on materials held by the library.
- vi. Providing proper storage and care of library materials; and
- vii. Working closely with related institutions to meet users' information needs.

1.2.2.1 Strathmore University Library Services

All the library services are fully automated using an open-source library management system called KOHA, which is web-based. The library management systems have all those modules that are fully functional, including the OPAC, where users can renew books and make book reservations online, reference and information services, current awareness services, selective dissemination of information, inter-library loans services, archival services, audiovisual services, online/internet service, room facilities, photocopying and printing services.

1.2.2.2 Information Literacy and Digital Literacy Programme at Strathmore University Library

Strathmore University was the first institution of higher learning in Kenya to integrate an information literacy program into its curriculum for both undergraduates and postgraduate students (Sawe, 2017; Chibini, 2011). The library's mission is to support teaching and learning at the University by engaging the students and the academic staff in developing and applying skills need to find, evaluate, and use information that will contribute to their academic success and lifelong learning. For this reason, the program of IL in SU is under the custody of the library and therefore, Strathmore University is expected to produce highly skilled graduates; thus, information literacy programs are essential.

Information Literacy Programme was started in 2011 and was integrated with communication skills as a course that covers many cross-cutting skills and is helpful to students throughout their life (Sawe, 2017). One of the skills to be covered was library skills, which were redefined to become information literacy skills and given an additional 6 hours. SU library developed policies that opened the way for developing an information literacy strategy. SU has divided the IL programme into three (3) modules (Strathmore University Library Annual Report, 2018) namely:

Module 1

- i. Library orientations/tours;
- ii. Understanding the organization of the resources in the library
- iii. Types of information resources (Primary, secondary, tertiary)
- iv. Use of reference books for information search
- v. Introduction to internet resources;
- vi. Role of the world wide web (www) in academics, research and development
- vii. Search engines;
- viii. Types of web resources;
- ix. Evaluating internet resources;
- x. Importance of electronic resources;
- xi. Different search techniques; and
- xii. Introduction to open access resources

Module 2

- i) Importance of academic honesty and quality research;
- ii) Intellectual property and fair use of copyrighted materials; and
- iii) Introduction to bibliographic citations.

1.3 Statement of the Problem

Globally, in the context of higher education, digital literacy has become increasingly crucial as universities incorporate advanced technologies into teaching, learning and research. This shift has also transformed academic libraries in the delivery of information services in support of the vision and missions of their parent institutions by providing information resources and services in various formats, including electronic resources, to support curriculum delivery and meet the academic needs of students and academic staff (Adeniran & Onuoha, 2018). Consequently, students, academic staff and librarians are expected to be digitally literate to fully engage with information resources, effectively participate in knowledge acquisition and develop relevant digital literacy skills for their academic and professional growth (Owansuan & Soyemi, 2022).

Digital literacy skills among postgraduate students at Strathmore University are manifested through their ability to access and effectively utilize electronic resources. Through training on navigating the university's library management systems, online databases and academic search engines, students must be equipped to locate essential resources such as peer-reviewed journals, e-books, and research publications necessary for their studies and research. This proficiency not only enhances their current academic research but also prepares them to navigate complex digital environments in their future professional careers (Strathmore University Library Annual Report, 2018).

Even though the provision of electronic resources in academic libraries in Kenya is recognized for supporting research and providing access to current information, it also presents a mirage of challenges as it is computer-based and requires digital literacy skills for searching, retrieval and use (Adeniran & Onuoha, 2018). A study

done by Nawi et al. (n.d.) on assessing digital literacy competence for online reading among postgraduate students in a Malaysian private university revealed that electronic resources are often underutilized by many users particularly the postgraduate students suggesting a digital literacy skills gap in their application which hinders their ability to fully utilize available electronic resources.

In addition, Wendo (2011) in his study on access and use of electronic journals by students and academic staff at the United States International University Library in Nairobi indicated that while electronic resources were available, many users lacked adequate skills to navigate and utilize these electronic resources fully. Similarly, Chibini (2011) study on the use of electronic journals by academic staff at Strathmore University found that, despite the availability of electronic resources, users faced considerable obstacles due to insufficient digital literacy training needed to utilize these resources effectively and inadequate knowledge and skills among librarians responsible for user education and digital literacy programmes or curriculum in SUL.

Strathmore University Library exemplify this issue, as internal reports and usage statistics from SUL electronic resources login rights (view usage statistics), off campus remote access logins, usage statistics and reports from the Kenya Library and Information Services Consortium (KLISC) reveal that electronic resources are not being fully utilized by postgraduate students. This underutilization poses a significant challenge, as SUL has made substantial investments in acquiring and subscribing to electronic resources, training programs and computer-based technologies to support access and usage (Strathmore University Library Annual Report, 2018). This then highlighted a discrepancy between the financial investment in electronic resources and their actual usage, raising concerns about user satisfaction

and the return on investment in terms of e-resource subscriptions and digital literacy skills.

This is endorsed by the findings of an annual report from Strathmore University Library in 2018 indicating that majority of librarians at SUL have inadequate digital literacy skills and need digital literacy training programs to be equipped with digital competencies to guide users in navigating and utilizing electronic resources. However, when librarians themselves lack these digital literacy skills they are unable to provide meaningful support services to users in utilizing electronic resources in digital space, which limits the ability of universities and libraries to integrate comprehensive digital literacy training programs (Sinha & Ugwulebo, 2024). In addition, most of the curriculum delivery at Strathmore University still focuses more on traditional training practices with slightly lows the level of digital technology applications (Strathmore University Library Annual Report, 2018).

A significant gap exists in the application of digital literacy skills among postgraduates and librarians concerning ICT infrastructures at Strathmore University Library. Despite the SUL provision of a good number of electronic resource databases and state-of-the-art ICT infrastructures, a notable number postgraduates and librarians struggle to apply their digital literacy skills to effectively utilize ICT and electronic resources with difficulties in navigating databases, unreliable internet connectivity, and limited proficiency in advanced search techniques. This issue is made worse by disparities in exposure to ICT infrastructures, which hinder equitable access to information. Furthermore, there is lack of consistent, targeted training programs aimed at developing specific digital competencies further undermines the SUL users ability to improve the use of its ICT infrastructure.

Coupled with the absence of an electronic resources policy at SUL exacerbates this gaps by creating a lack of structured guidelines and priorities for electronic resource acquisition, access management, training and usage. Without such a policy, there is no strategic framework to support the alignment of digital literacy initiatives with electronic resource availability and user needs (Strathmore University Library Annual Report, 2018). These gaps not only undermine postgraduate students from fully utilizing electronic resources but hinder their lifelong learning, research work and professional skills. Thus, this situation prompts the need for this study, with the view to determining the application of digital literacy skills by postgraduate students to access and use electronic resources at SUL and suggesting measures for improvement.

1.4 Aim

The aim of the study is to investigate the application of digital literacy skills by postgraduate students to access and use of electronic resources at Strathmore University Library with a view to suggesting measures for improvement.

1.5 Objectives

The study addresses the following objectives; to:

1. Investigate the level of digital literacy skills on access and use of electronic resources by postgraduate students.
2. Examine the application of ICTs and digital literacy skills in facilitating adequate access and use of electronic resources by postgraduate students.
3. Analyze the type of digital literacy training programmes in place for postgraduate students in facilitating access and use of electronic resources.

4. Identify the challenges postgraduate students encounter in applying their digital literacy skills for accessing and utilizing electronic resources by postgraduate students.
5. Propose strategies to enhance digital literacy skills, enabling better access to and utilization of electronic resources by postgraduate students.

1.6 Research Questions

In order to achieve the research objectives, the study will seek to answer the following questions.

1. What level of digital literacy skills do postgraduate students possess, and how does it support access and use of electronic resources?
2. How does application of ICTs and digital literacy facilitate effective access and use of electronic resources by postgraduate students at Strathmore University Library?
3. How adequate are the digital literacy training programmes for the postgraduate students in facilitating access and use of electronic resources?
4. What are the challenges experienced by postgraduates in relation to digital literacy skills when accessing and using electronic resources?
5. What strategies can be implemented to enhance digital literacy skills among postgraduate students in order to improved access and use of electronic resources at SUL?

1.7 Assumption of the Study

The research was carried out with the following assumption in mind;

1. That there are generally limited digital literacy skills of users leading to underutilization of electronic resources.

2. That Strathmore University Library can improve access and utilization of electronic resources if users are imparted with the necessary digital literacy skills.
3. That it is possible to stimulate the use of electronic resources when users are equipped with digital literacy skills, given adequate orientation, information searching, and retrieval skills.

1.8 Significance of the Study

It is hoped that the study will be significance in the following ways:

1.8.1 Theoretical Significance

Glister (1997) puts it: “Not only must you acquire the skills of finding things, but you must also develop the ability to use things in your life.” It is hoped that the findings of the study will contribute to and constitute the existing body of knowledge relating to digital literacy skills and inspire postgraduate students of Strathmore University to acquire digital literacy skills necessary for utilizing electronic resources in support of teaching, learning and research. The study would enable information professionals and users to deeply understand the relevance of digital literacy skills possessed by postgraduates to enhance their academic pursuit within the academic environment and beyond and be in a pole position to access and use electronic resources. Also, it would enable information professionals and academia to be aware of the level of digital literacy skills of postgraduates and strategize innovative ideas to develop, use and improve students' digital literacy skills to access online resources.

1.8.2 Pragmatic Significance

Glister (1997) alludes that the skills of the digitally literate are becoming as necessary as a driver's license and with the Internet's growing universality will create priceless resources for learning and self-advancement. It is hoped that the study's findings and recommendations will give practical ways of enhancing digital literacy skills that will contribute immensely to enhancing access and use of electronic resources in the Strathmore University Library. The findings recommend suitable training methods for library staff and students on how to operate computers, navigate the Internet, search, access, download, retrieve and utilize electronic resources and ascertain whether the existing resources are effectively utilized for research, teaching, and learning.

1.8.3 Policy Significance

It is hoped that the findings of the study will help recommend appropriate digital literacy training programs that could be applied to equip users with relevant skills to access and use electronic resources. There is finite policy and research attention paid to issues related to digital literacy in Kenya, and there is still relatively little information on how the inadequacy of digital literacy skills affects the quality and quantity of knowledge acquired by postgraduate students in universities in Kenya. This study would benefit library staff, lecturers, undergraduates, and postgraduates in all facets of education programs interested in the creative and critical uses of technology in teaching, learning, and research processes. Also, the finding of this study would help the Government enact educational policies that will encourage the inculcation of digital literacy skills in students at an early stage. Finally, the finding of this study will also add to the existing body of knowledge on digital literacy skills for research purposes.

1.9 Scope and Limitation of the Study

1.9.1 Scope of the Study

There has been need to justify the huge investment made in subscription of electronic resources, training and acquisition of computer-based technologies at SUL. It has also established an information literacy training section within the library to ensure users are trained to improve and boost their digital literacy skills on the use of ICTs to search online, access and use electronic resources. Hence the need for postgraduate student and staff to be equipped with these skills to assist them to access and use electronic resources.

The focus of this study, among other issues was: to investigate the level of digital literacy skills on access and use of electronic resources by postgraduate students; examine the application of ICTs and digital literacy skills in facilitating adequate access and use of electronic resources; find out the type of digital literacy training programmes in place, and possible strategies to improve on digital literacy skills to facilitate adequate access and use of electronic resources. The study target Strathmore University Library because is one of the top ranked private universities in Kenya with a modern state-of-the -art library, providing a full range of high quality services based on both print and electronic resources to users. The population of the study comprised of library staff because of their roles in training users on access and use electronic resources and postgraduate student who are expected to acquire digital literacy skills to make considerable use of electronic resources to meet their information needs. The above respondents play a significant role in the study.

1.9.2 Limitations of the Study

The study was limited to Strathmore University library, a private institution with modern technological infrastructure and resource availability, which may not reflect

the realities of other higher learning institutions, particularly public universities which often face mirage of challenges with varying levels of technological access, digital literacy skills and insufficient financial resources. However, the finding will only be limited to private universities in similar set-up. Data collection was challenging due to the busy schedules of both students and librarians, as it took place during regular working hours, causing frequent interruptions. To minimize disruptions, the researcher coordinated with respondents to schedule interviews and questionnaire completion at convenient times.

Some participants were reluctant to respond which caused a delay for the researcher to finish data collection in time hence limiting the time of analysis. Additionally, reliance on self-reported data may introduce potential biases, as respondents may have overestimated or underestimated their digital literacy skills. In spite of the limitations identified, the validity and reliability of the study findings were ensured.

1.10 Definition of Operational Terms and Concepts

Access

Access in this study should be understood as the opportunity to use digital devices to retrieve and make beneficial use of electronic resources. The ability for postgraduates to successfully locate, retrieve and use the information contained within various computer systems. It is a concept that incorporates a host of behavioural, philosophical, technical, and policy issues. The term can extend beyond computers and incorporate all information systems and resources.

Digital Literacy Skills

The ability to use digital technology, communication tools, and networks to access, manage, integrate, evaluate and create information to function in a knowledge society.

Electronic Resources

IFLA defines Electronic Resources as "those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the Internet or locally".

Information literacy

Information literacy is defined as the ability to recognize when information is needed and effectively on that need.

Use

In the historical context of electronic resources, use refers to page views to abstracts, full-text, and search engine pages.

Use is the frequency of resource access made by users.

1.11 Structure of the Thesis

The study is divided into five chapters as follows:

Chapter One: Introduction and Background to the Study

The chapter covers: Introduction and background to the study; statement of the problem; aim of the study, objectives of the study; research questions; assumptions of the study; significance of the study; scope and limitations of the study; and definition of operational terms and concepts.

Chapter Two: Literature Review

This chapter reviews theoretical and empirical literature in books, journal articles, online databases, and other sources. The gaps in the literature are identified, and the contribution of this study in addressing them is adduced.

Chapter Three: Research Methodology

This chapter presents in detail the research approach, research design, study population, sampling technique, sample size, data collection methods, data analysis, validity and reliability of the data collection instruments, and ethical considerations.

Chapter Four: Data Presentation and Analysis

This chapter presents the findings of the study, guided by theory and research questions.

Chapter Five: Interpretation and Discussions of Findings

The chapter discusses the findings and examines their implications based on the research questions.

Chapter Six: Summary of Findings, Conclusion and Recommendations of the Study

The chapter provides a summary of findings, conclusions and recommendations based on the data presented and interpreted

1.12 Chapter Summary

This chapter introduces the conceptual setting of the study. The chapter has defined digital literacy skills and electronic resources and by extension discussed the application of digital literacy skills by postgraduate students to access and use electronic resources. The contextual setting of digital literacy skills and electronic resources has been discussed and Strathmore University Library is the focus point.

The chapter has also provided the statement of the problem, motivation of the study, purpose of the study, research objectives, and research questions. Further, the chapter has presented the significance, scope and limitations of the study. The proposed structure of the thesis has been outlined too. The next chapter provides a critical analysis of the literature and the frameworks on which the study is anchored.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter highlights, reviews and explores the relevant literature on the themes of the study which reveal what strategies, procedures and measuring instruments are useful in investigating the research problem.

A literature review is a written assessment of what is already known or published aimed at giving a reader an understanding of what is already known on a research topic (Lacey et al., 2011). It involves the interpretation of a selection of published and unpublished documents available from various sources related to the area of study that optimally involves summarization, analysis, evaluation, and synthesis of the documents (Ng'eno, 2018). A literature review is important because it integrates what others have done and said, criticizes previous scholarly works, builds bridges between related topics, and identifies the central issues in a field (Cooper, 2011).

In the present study, the literature review has been used to choose an appropriate research topic, formulate reliable objectives and research questions, design appropriate research methodologies, and justify why the study is important. The purpose of the study was to investigate the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University Library with a view to suggesting measures for improvement. In tandem with these purposes, this study identified several primary and secondary literature sources including books, electronic resources, conference proceedings, websites, and theses. A preliminary review of the literature presented in chapter one revealed a gap in empirical studies on digital literacy skills of postgraduate students on access and use of electronic resources.

The chapter is organized around themes of research questions, key variables of the underlying theory, and broader issues on the research problem. The themes reviewed include theoretical framework, digital literacy skills and access and use of electronic resources, the role of ICTs and digital literacy skills in facilitating and utilizing electronic resources, and digital literacy training programs.

2.2 Theoretical Framework

A theory serves as a lens through which a researcher examines a particular aspect of his or her subject field (Ocholla & Le Roux, 2011). A theoretical framework can be conceived as a structure or blueprint that identifies and describes the major elements, variables, or constraints that organize research (Jacard & Jacob, 2010). According to Ravitch and Matthew (2017), a theoretical framework is useful scaffolding that could be used to understand hypotheses or provide explanations of the relationships amongst elements that are antecedents of particular outcomes detailed in a study.

Theoretical framework should fit its purpose for it to inform an inquiry effectively. Therefore, developing a theoretical framework to guide research is the central piece of the research puzzle. This explains why Maxwell (2013) suggests that the most critical part of the research plan is the theoretical framework. The preceding section examines the theories underpinning the study.

2.2.1 Theories Underpinning the Study

The study was primarily underpinned by the triangulation of the Model of Student Digital Literacies by Beetham and Sharpe (2011) and the Horizontal Pyramid Model advanced by Ndubisi and Jantan (2003) which is based on the Technology Acceptance Model by Davis (1989). No single theoretical model was found comprehensively adequate to cover all study aspects. Therefore, the triangulation of

two theories was preferred to strengthen the study findings' credibility and applicability as Yin (2009) recommended.

2.2.1.1 Model of Student's Digital Literacies by Beetham and Sharpe (2011)

The Model of Student Digital Literacies was developed by Beetham and Sharpe (2011). The model explains how students in institutions of higher learning can optimally use ICTs to access and utilize electronic resources by effectively searching, accessing, and retrieving a vast sea of online information from various electronic resources databases that would enhance their quality of learning and increase their research productivity in the learning environment. The model focuses on functional access, skills, and practice necessary to become digitally literate and confident users of a diverse set of technologies for personal, academic, and professional purposes.

A study done by Beetham and Sharpe (2011) on understanding students' use of technology for learning towards creative appropriation suggests that learners experience a lot when learning in a technology-rich environment and that students engage in all sorts of technology-mediated activities for their academic pursuit. Beetham and Sharpe (2011) model of students' digital literacies was inspired by Maslow's (1943) hierarchy of needs. Both Beetham and Sharpe's Student digital literacies model and Maslow's hierarchy of needs have lower levels that define fundamental elements and top levels representing more enduring aspects of identity.

The Students' digital literacies model (Figure 2.1) comprises four levels representing the critical digital literacy skills that a learner (herein postgraduate students) should have to effectively access electronic resources; access, skills, practices, and attributes. The Students' digital literacies model was developed to understand factors

influencing learners' acquisition of digital literacy skills. The model not only distinguishes between the four levels of digital literacies namely: access, skills, practices, and attributes but also articulates how they relate in a hierarchy

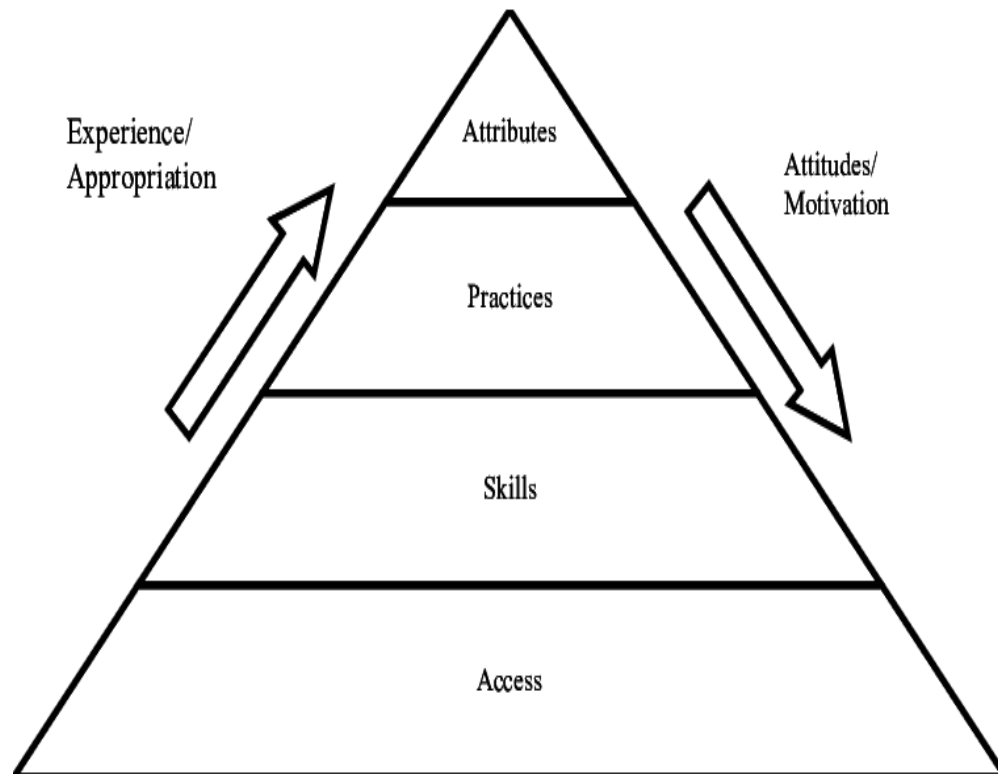


Figure 2.1: Model of Students' Digital Literacy (Source: Beetham and Sharpe, 2011)

Beetham and Sharpe's model was successfully used in a related study analyzing the digital literacy practices of students in institutions of higher learning in Malaysia (Ganapathy & Kaur, 2015).

2.2.1.1.1 Key Variables Model of Student's Digital Literacies (Beetham and Sharpe, 2011)

a) Access

Access is at the bottom layer of the pyramid, and represents the most fundamental conditions that learners require in engaging with technology to support their learning (Waycott et al., 2010). These include access to institutional ICTs, internet

connectivity, web-based tools, online resources service, and appropriate hardware. Beetham and Sharpe (2011) also propose time management as an aspect for consideration at the access level. Students access and use digital technology for such learning activities as reading and sending email, accessing learning management systems, reading e-journals or e-books, doing online quizzes, participating in discussion forums, and so on (Jones et al., 2010; Waycott et al., 2010)

The model purports that institutional provision to access personal technology by learners makes learning more exciting and convenient. The model posits that learners need to be enlightened on how to access or own digital devices and take advantage of ICTs and the Internet to access and use electronic resources. This if considered, would significantly assist the learner in their learning and research activities. The model, therefore, suggests that institutions of learning should provide access to ICTs infrastructure and subscriptions to relevant electronic resource databases. Additionally, and more significantly, the model suggests that the learner should be aware of the existing ICT infrastructure, subscribed electronic resources, and barriers that may hinder the effective application of digital literacy skills to access and use electronic resources.

b) Skills

At the second level of the framework is the Skills which represent the mastery that learners tap on when using technology in learning. Such skills include information literacy, ICT skills, access and use of different types of information sources and media, and digital, social, and professional group interactions amongst others. The model asserts that information and digital literacy skills emerge through guidance and practice using computers and ICTs to access online resources. More importantly,

the model explains that learners can use technology skillfully in accessing and using electronic resources for their learning and research activities.

The skills level of the student's digital literacies model concerns learners acquiring digital literacy skills and gaining confidence and expertise as they use technology to access and utilize online information in their various learning contexts. Digital literacy skills are depicted as vital to enhance the confidence of learners in using electronic resources and online databases through applying and practicing their skills in different learning contexts for different learning activities and objectives (Owansuan & Soyemi, 2022). The model underscores learners' access and utilization of electronic resources require fundamental digital literacy skills such as browsing, searching and filtering data, access, and retrieval, downloading, document conversion skills, evaluating digital content, managing data, communication, and collaboration.

In the context of this study, this may be understood as suggesting that as long as the universities are the bastion of learning for skilled human resources, postgraduate students can have unlimited access to and utilization of vital electronic resources with the right digital literacy skills. The above insights explain that digital literacy skills equip learners to use ICTs to efficiently access and utilize electronic resources. As such, learners are expected to acquire skills through digital literacy training and should be encouraged to embrace new technology in their academic activities. Adeoye and Adeoye (2017) emphasize the need for students to have digital literacy skills to function in a digital environment for academic pursuit as this would help them to be able to use technological devices to interact and connect with others, especially on issues that relate with their academic activities.

c) Practices

At the third level, the model of Students' digital literacies model posits that learners make informed choices on how best to utilize technology individually or with others to enhance their learning experiences by developing individual, flexible strategies based on their immediate needs and context. This implies that postgraduate students can combine and make informed choices about which technology to use to assist in their learning and research activities.

The model further suggests that practice and training boost and equips learners with skills and improves their overall performance in using technology to access and use electronic resources for academic and research purposes. At this level of practice, through exposure to technological devices, digital literacy, and electronic resources training, learners become skillful in using technology to access and use electronic resources to meet their information needs and acquire, improve, up-skills, and re-skill their digital literacy skills over time as they use technology to access online resources. This would mean that learners can make informed choices and decisions on which technology to best use, choosing from a range of possible approaches. Becoming more aware of what they find also would help their learning activities and develop their strategies for accessing online information resources.

d) Attributes

This top-level relates to learners' attitudes and identities concerning their learning. The model posits that learners at this level can decipher the value and potential of using technology to support their learning. Sharpe (2014) associates six attributes to this level: being engaged, connected, confident, adaptable, intentional, and self-aware. These attributes are built on skills and practices already acquired. The

learners at this level would have their reasons for the choice of technology to use in which situation, how social they are in their learning, and how they manage and personalize the resources they need. They would be able to take control of their learning, making suggestions for uses of technology that go beyond what is expected by their lecturers.

The model does not only differentiate between access, skills, practices, and attributes but also articulates how they relate in a hierarchy. It demonstrates how students' experience using technology and applying it in learning contexts drives their sense beliefs and attitudes. Thus, the left-hand upward arrow of the model shows how access could influence the development of skills resulting in effective practices and identification in a confident digital learner. Similarly, the right-hand downward arrow illustrates how a student's attitude toward technology could induce inspiration to learn new practices, develop new skills, and acquire access.

2.2.1.1.2 Application of Model of Student's Digital Literacies (Beetham and Sharpe, 2011)

The model of students' digital literacies provides a useful framework for understanding the different skills and competencies that students need to develop to be effective digital learners. This study upholds the model of students' digital literacies recognition that learners (herein postgraduate students) need functional access, skills, practices, and attributes to effectively use technology (herein the digital platform and electronic resources).

The ability to access and use electronic resources requires a combination of technical, information, and communication digital literacy skills. Subsequently, this study construes the model of students' digital literacies as advocating for

postgraduate students to integrate and use technology in the new academic paradigm by effectively searching, accessing, and retrieving information from various electronic resources databases for their assignments, research reports writings, daily academic routines, and professional advancements. In particular, the model was used as a lens to investigate the digital literacy skills of postgraduate students that aid them in effectively accessing and using electronic resources (Research question 1), the diversity, comprehension, and facilitation of the digital literacy training programmes (Research question 3), and in interpreting the range of digital challenges (Research question 4) the postgraduate students encounter as they access and use the electronic resources. The ensuing text is a detailed description of the application of the various levels of the model of Student's Digital Literacies to the study.

The model of student's digital literacy's offers a structured approach for understanding the levels of digital literacy possessed by postgraduate students and how they support access to and use of electronic resources (Research question 1). The model outlines digital literacy development in stages, starting with access, which investigates whether students have basic access to ICT infrastructure and electronic resources offered by the university library. At the skills level, postgraduates acquire the operational capabilities to navigate and use electronic resources, such as performing searches and retrieving materials from databases (UNESCO, 2018). At the practice level, students meaningfully apply digital literacy in academic contexts and investigate whether students can critically evaluate, select, and use electronic resources effectively, going beyond simple access to more advanced use of digital tools. Lastly, at the attribute level, the model examines how confident students feel in their digital capabilities, which directly influences their motivation and effectiveness in using electronic resources.

The model was also useful in mapping core skill requirements in formal and informal training for digital fluency. Importantly, it provides a progression style approach to core skills development as a person expands their understanding of and control over their digital literacy competencies as they access and use electronic resources (Research question 3). The model provides a comprehensive framework for investigating the adequacy of digital literacy training programs for postgraduate students in facilitating access and use of electronic resources. In the context of postgraduate students, effective training programs must address this progression, ensuring that students not only gain functional skills but also develop the critical thinking necessary to evaluate and integrate electronic resources into their academic work. The model suggests that adequate training programs, therefore, should guide students through these stages, helping them move beyond basic usage to sophisticated, reflective and innovative access and utilization of electronic resources.

On the virtue of the enumerated progressive digital skills, the model served as a useful benchmark in analyzing the digital literacy inadequacies of the postgraduate students manifested in the challenges they experience in their access and use of electronic resources (Research question 4). This was gauged in terms of the nature and degree of support they were able to work, their familiarity with the context of their need both in terms of technological, informational, and communication requirements, and the complexity of the tasks. At access level, a notable challenge is the lack of adequate access to ICT infrastructure and reliable internet which can hinder postgraduate student ability to access electronic resources. This challenge may arise from ineffective integrated library management systems, inadequate training or lack of access to personal devices.

2.2.1.1.3 Gaps in the Model of Student's Digital Literacies

Although the model of students' digital literacies suggests that using technology to access and utilize electronic resources is necessary for academic libraries; and despite the perceived necessity of new and sophisticated technology, postgraduate students who use such technology may not readily embrace such tools. A notable limitation found in the model is its inability to address the individuals' self-efficacy in their ability to perform a task. In the context of digital literacy, self-efficacy could be used to investigate how students' beliefs about their ability to use digital technologies influence their use of electronic resources.

Consequently, a second model, the Horizontal Pyramid Model by Ndubisi and Jantan (2003) based on the Technology Acceptance Model (TAM) by Davis (1989), was considered in an attempt to address the observed gap.

2.2.1.2 The Horizontal Pyramid Model Advanced (Ndubisi and Jantan, 2003)

The Horizontal Pyramid Model advanced by Ndubisi and Jantan (2003) is based on the Technology Acceptance Model by Davis (1989). Technology Acceptance Model (TAM) was proposed by Davis in 1989 and is one of the most influential and robust theories in explaining IT/IS adoption behaviour.

Digital literacy involves an array of skills that allow an individual to effectively carry out tasks in a digital environment. As theorized, computing skills directly and indirectly influence the usage of digital platforms. Computer literacy is central to the activities and tasks performed digitally, whether it is surfing the web, searching databases, or social networking amongst others. Affirming this relationship is the Horizontal Pyramid Model advanced by Ndubisi and Jantan (2003). The model which is based on Technology Acceptance Model by Davis (1989) was an output of

a study that examined the role of computing skill and technical backing as anchors to perceptions of usefulness and ease of use in determining information systems use in small and medium firms in Malaysia.

Ndubisi and Jantan conceptualized computing skills as a synergy of hands-on experience and procedural information and coaching provided by experts to users while technical backing as before-adoption and after-adoption support. Their findings established that not only do computing skills and technical backing serve as strong anchors to users' perceptions of the usefulness and ease of use of information systems, but they also wield a direct influence on systems usage. Computing skills was conceptualized as a synergy of hands-on experience and procedural information and coaching provided by experts to users while technical backing as before-adoption and after-adoption support. In their horizontal pyramid model presented in Fig 2.2, they show the relationships between computing skill and technical backing on the one hand and usage on the other were mediated by perceived usefulness and ease of use with their respective beta coefficients.

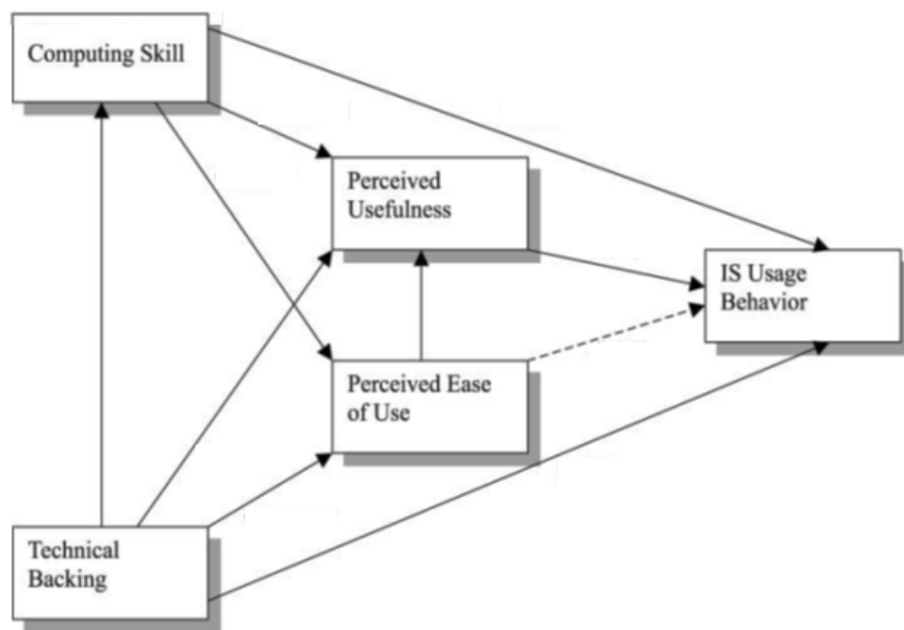


Figure 2.2: The “Horizontal Pyramid model”

Based on their literature review, Ndubisi and Jantan (2003) hypothesizes the following:

H₁: Perceived usefulness of a specific system will have a significant direct impact on its usage.

H₂: Perceived ease of use of a specific system will directly impact its use.

H₃: Perceived ease of use of a specific system will have a significant indirect impact (via usefulness) on its use. Computing skills refer to hands-on experience with systems, procedural information, and coaching provided by experts to users.

H₄: The computing skill of a user will strongly determine his or her usage of the Information System.

H₅: The computing skills of a user will strongly determine his or her perception of the usefulness of a specific system.

H₆: The computing skills of a user will strongly determine his or her perceptions of the ease of use of specific systems.

H₇: Usage of Information Systems will be greater when strong technical backing is available.

H₈: The availability of strong technical backing will lead to a more favourable perception of the system's usefulness.

H₉: The availability of strong technical backing will lead to a more favourable perception of the system's usefulness.

2.2.1.2.1 Application of the Horizontal Pyramid Model to the Current Study

In applying the Horizontal Pyramid Model by Ndubisi and Jantan (2003), this study attributed low usage of electronic databases to low computing skills/knowledge, which is in turn bedrock of digital literacy. On one hand, computer skills are hereby perceived as the expertise necessary to use the electronic resource database. On the

other hand, technical backing (renamed training and technical support) involves formal and informal training, orientation, or any form of support given to postgraduate students to access and use the electronic database. ICT skills and technical backing are construed as having a direct impact on access and use of electronic resources and indirect influence through individuals' self-efficacy of perceived ease of use and perceived usefulness. Technical backing is further construed as having a direct impact on ICT skills.

As the model was developed on the platform of TAM, its use in the study enables an understanding of the relationship between the perceptions of benefits and usability of the system supporting electronic resources and actual access and use of electronic resources. From the above interactions, the following assumptions are derived:

- Computer skills of a user will strongly determine the usage of electronic resources.
- Technical backing including formal and informal training, orientation, or any form of support given to the user will determine the usage of electronic databases

As such, the model was most significant in understanding objective two (influence of ICT on access and use of electronic resources) and objective four of the study (challenges faced in access and use of electronic resources).

The model provides a comprehensive framework that can be used to understand how Information and Communication Technologies (ICTs) and digital literacy skills facilitate the access and use of electronic resources in environments like university libraries (Research question 2). The model is structured around three interrelated components: ICT infrastructure, digital literacy skills and electronic resources usage.

The model refers to the availability and quality of ICT systems, including internet connectivity, digital platforms, and computer hardware. In the context of Strathmore University Library, the adequacy of these technological resources is a critical factor in determining whether users can efficiently access electronic resources. Without a robust ICT infrastructure, even well-developed digital collections remain inaccessible or underutilized, limiting their potential to support learning and research.

Secondly, even with proper ICT infrastructure in place, postgraduates at Strathmore University must possess the necessary skills to search for, retrieve and utilize electronic information (Research question 2). Enhancing digital literacy through training programs and workshops would empower postgraduates to make full use of the library's electronic resources. Lastly, the usage component of the Horizontal Pyramid Model focuses on the extent to which users adopt and integrate ICT systems into their daily academic routines. For Strathmore University Library, this means ensuring that the electronic resources are not only accessible but also aligned with the academic needs of its users. Factors such as ease of access, user-friendly interfaces, and the relevance of the resources play a significant role in encouraging effective and consistent use.

2.2.1.2.2 Gaps in Using Horizontal Pyramid Model

The most commonly reported limitation of the Horizontal Pyramid Model is the measurement of usage by relying on respondents' self-reporting and assuming that self-reported usage reflects actual usage. A second limitation is the type of respondents or the sample choice. The model provides feedback on usefulness and ease of use but does not provide feedback about aspects of improvement that might enhance adoption, such as flexibility, integration, completeness of information, and information currency. Such guidelines were at the core of TAM development but

failed to receive the appropriate attention (Davis et al., 1989). 2.2.1.3 Triangulation of students' digital literacies and the Horizontal Pyramid Model

A triangulation of Beetham and Sharpe's (2011) model of students' digital literacies and the Horizontal Pyramid Model by Ndubisi and Jantan (2003) was used in developing the conceptual model (Figure 2.3) used to inform the study.

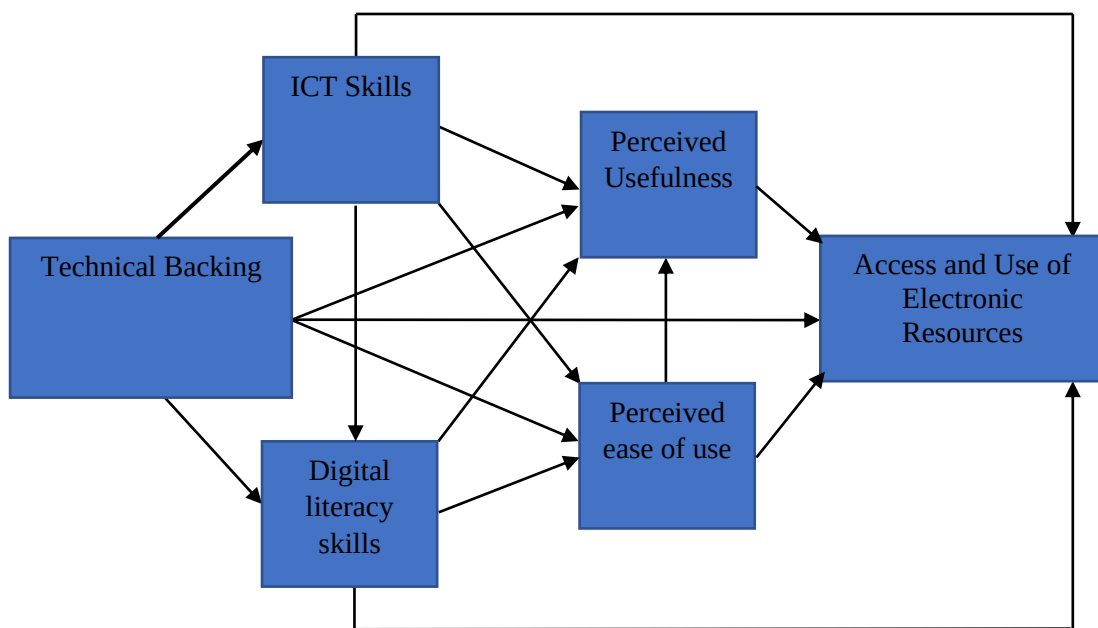


Figure 2.3: Triangulation of model of students' digital literacies and the Horizontal Pyramid Model

The Triangulation framework is based on several prepositions. Digital literacy, ICT skills, and technical backing are construed as having a direct impact on access and use of electronic resources and indirect influence through individuals' self-efficacy of perceived ease of use and perceived usefulness (Research question 1). Technical backing (Training and all support provided to users) is further construed as having a direct impact on both ICT skills and digital literacy whereas ICT skills are considered to have a direct impact on digital literacy (Research question 2 &3). The Digital Literacy Skills Framework constitutes the core skills across four interactive dimensions as defined by Beetham and Sharpe's (2011) model of students' digital

literacies. The Horizontal Pyramid Model has been adopted with modification; computing skills have been widened to ICT skills.

ICT (Information and Communication Technology) skills and digital skills though related are not entirely the same thing. ICT skills typically refer to the ability to use various technologies to process, manage, and communicate information. This includes things like using email, creating spreadsheets, managing databases and using software applications like Microsoft Office or Adobe Creative Suite. ICT skills also include programming, networking, and hardware maintenance. Digital skills, on the other hand, encompass a broader range of competencies that are required for effectively navigating the digital world. These may include ICT skills but also extend to skills like online safety, digital literacy, social media management, and understanding how to use various devices and platforms (Research question 1).

In essence, ICT skills tend to focus more on technical competencies related to specific technologies, while digital skills encompass a broader set of abilities that are required to effectively operate in a digital world. It is the position of this study that while Digital Literacy and ICT skills are interrelated, to be effective, responsible technology users, we need to have both to effectively access and use electronic resources.

In sum, the Model of Student Digital Literacy (Beetham and Sharpe, 2011) and the Horizontal Pyramid Model (Ndubisi & Jantan, 2003) complement each other as a theoretical lens in addressing the research questions. The Model of Student Digital Literacy addresses the level of digital literacy skill of postgraduate students, the application of ICTs and digital literacy skills help to facilitate adequate access and use of electronic resources, Institutional facilitation such as electronic resources

subscribed (Research question 2), and training programs in place to support the development of digital literacy skills thereby enhancing the access and use of electronic resources (Research question 3). The Horizontal Pyramid Model factors in the acceptance and application of technology that supports digital literacy skills in facilitating access and use of electronic resources in a technology-rich environment.

2.3 Themes Relevant to the Study

The next section is a review of themes gleaned from the underpinning theoretical models, research questions, and broader issues on the research problem. Within each theme, the international context is reviewed followed by regional, national, and local contexts.

2.3.1 Concept of Digital Literacy Skills

The 21st century is an era marked by much technological advancement from cradle to adulthood that has greatly affected the essence of an individual's life. Martin (2006) describes this era as digitally infused, an e-world, a world penetrated by the effects and products of electronic technology in various endeavours. In such an environment, the literacy of reading and writing no longer measures effective education. Instead, an indisputable blend of other skills that include information literacy skills, and digital literacy skills, amongst many other competencies are paramount.

Scholars have defined digital literacy differently. According to Gilster (1997, p.1), the person attributed to the origins of the contemporary understanding of the concept, digital literacy involves "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers." Mirzaei and Sarrafzadeh (2020) later expanded on this definition stating that digital

literacy is a set of skills that enable people to use digital space to succeed in their personal, academic, and professional lives. They consider it as simply the ability to find, evaluate, use, share information, and produce content using information technology and the Internet. Amplifying its scope of application, Mirzaei and Sarrafzadeh (2020) describe digital literacy as a set of skills that enable people to use digital space to succeed in their personal, academic, and professional lives. They consider it as simply the ability to find, evaluate, use, share information, and produce content using information technology and the Internet.

Concerning students, Yo (2021) defines digital literacy as the availability of knowledge and skills necessary for students' safe and effective use of digital technologies and Internet resources for their academic purposes. And in the context of postgraduate students' electronic resources competencies, Antoninis and Montoya (2018) defined digital literacy skills as involving browsing skills, searching and filtering data skills, information and digital content creation skills, evaluating digital content, managing data, communication, and collaboration when it is presented through computers and supports postgraduate students to solve the broadest range of tasks associated with the use of electronic resources for academic and research work.

It is clear from these sampled definitions that there is no one-size-fits-all definition of digital literacy. Rather, it is a complex and multifaceted concept that can be understood in different ways depending on the context and the goals of those using the term. Nonetheless, a common emphasis cutting across the variant definitions is that digital literacy involves mastery of skills and tools. Several examples exemplify this.

A study undertaken by Udoh et al. (2020) concerning digital literacy skills of undergraduate students of Library and Information Science vis-e-vis the utilization of electronic resources revealed that digital literacy skills capture a bouquet of knowledge, competencies, skills, attitude, and behaviors necessary for students to access and utilize a network of technologies to locate and use electronic resources for their scholarly and solving academic problems like doing assignments, writing term-papers, conducting research and this has become an apparent reality for postgraduate students of any academic discipline.

Alqudah and Muradkhanli (2021) explained that the emergence of the Internet and other electronic sources of information has led to a shift from traditional methods of searching, retrieving, sharing, and disseminating information, to the use of digital methods, which depend on the use of devices and tools that are managed digitally. Therefore, postgraduate students are expected to be digitally literate, a necessity of the digital society, to effectively navigate and use electronic resources for various academic activities.

Echoing the same sentiments, Cln and Cln (2021) emphasize that postgraduate students who will effectively use electronic resources for their study, research, and other academic work must be critical and skilled users of online information resources. This is to say that while electronic resources offer enormous opportunities for postgraduate students and continually exert pressure on the institutions of higher learning and their libraries to subscribe to vast databases and online resources, it is pertinent for postgraduate students to be digitally literate to effectively use the university learning experiences and opportunities. This view is further supported by Hague and Williamson (2009) who believe that digital literacy skills are crucial in

facilitating effective searching, accessing, and retrieval of vital online information needed by postgraduate students in pursuit of their daily academic work.

Kari (2004) aptly underscores that the skills required to use electronic database resources are higher than the ones required for searching printed sources and that postgraduate students need to master specific digital literacy skills to exploit and use the growing range of electronic resources. Yo (2021) asserts that the level of digital literacy skills possessed by students will enhance their quest to retrieve information from the Internet or the World Wide Web, online databases, e-books, e-journals, e-conversations, e-government reports, digital images, or any number of other possible digital sources to satisfy their information needs.

A case in point is a study undertaken by Abrosimova (2020) concerning the level of digital literacy skills of 163 students at Kazan Federal University, Russia. A hundred (63%) respondents admitted to having high digital literacy skills that are mostly sufficient for e-navigation and access to electronic resources. This result was expected as Russia has developed and implemented policies that improve students' digital competencies. This is in contrast to Christy and Yusuf (2021) findings of an investigation of the level of digital literacy skills possessed by academic librarians in Nigerian Universities that revealed a low level of digital literacy skill possession by most respondents.

The researchers concluded that postgraduate students need adequate digital literacy skills to effectively select, evaluate and use appropriate, reliable, and current information sources to meet their study-related information needs. However, such research findings that show low digital literacy level amongst the students increases curiosity and raises questions as librarians are expected to advocate for students'

digital literacy. Similarly, the study concluded that there is a need for policies and guidelines to governing

2.3.2 Application of ICT and Digital Literacy Skills on Access and Use of Electronic Resources

Technological advances have brought radical changes in how modern organizations operate (Sharma, 2009). It has influenced how libraries gather, store, organize, retrieve, and consume information. This has necessitated the change of academic activities from analog to digital platforms. The necessitated shift caused by the emerging technologies also explains why most traditional libraries are transforming into hybrid libraries and storing most of their information resources in an electronic format. University libraries in Kenya have not been left behind. With the current improvement in ICT, these libraries have invested significantly in providing services through computer-based technologies and subscriptions of electronic resources (Wendo, 2014).

This calls for a shift from the traditional ways of accessing information to the modern way which entails effective use of ICTs and the application of digital literacy skills by students in accessing and utilizing electronic resources (Omosekejimi et al., 2018; Saeed & Sheik, 2011; Subaveerapandiyan et al., 2022). The ripple effect is that students are increasingly expected to be digitally literate so that they can appropriately use technology to participate actively in acquiring knowledge and skills (Owansuan & Soyemi, 2022).

These developments and undertakings have presented libraries with opportunities as well as challenges to engage patrons on the best way to use ICTs and subsequently provide improved access and maximum access and utilization of unlimited vast

global online electronic resources for quality learning and research. To justify the investment in ICTs and electronic resources, the librarian must ensure that their use is maximized. This requires librarians to be fully equipped with the prerequisite knowledge and skills to function in a digital platform and be able to develop strategies for promoting digital literacy among their users (Emiri, 2017).

As earlier pointed out, the functional role of digital literacy is the development of individuals' confidence and ability to use ICTs to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. Digital literacy affects not just academic, but also personal development and future employment. Importantly, digital literacy skills help students showcase their ability to learn and apply new technology skills and present their ideas more innovatively, thereby improving their academic performance (Owansuan & Soyemi, 2022). This implies that students without digital literacy may be cut off from benefiting from this transformation.

The role of technology and the application of digital literacy skills in accessing and using electronic resources thus hold significant promise in teaching, learning, and research in institutions of learning (Abdullah, 2009). And as Tella and Mutula (2008) explain, students with higher computer literacy are inclined to use the computer to access and make use of electronic resources more readily. It, therefore, follows that only students with adequate digital literacy skills are likely to effectively use ICTs to access, retrieve and use electronic resources (Ankrah & Atuase, 2018). Omosekejimi et al. (2018) also believe that ICT tends to expand access to education whereby learning can occur anywhere, anytime, and online information resources can be accessible 24 hours. The fact that learning and teaching no longer depend exclusively on printed materials but on a combination of abundant resources on the Internet

means that knowledge can be acquired through access to electronic resources (Kaur, 2014).

Blakes (2006) views the adequacy of information resources and ICTs facilities and skills as of paramount importance if a library is to truly serve, meet, and even exceed its users' needs and requirements. ICT infrastructure and digital literacy skills training are recognized as preceding the acquisition and provision of electronic resources since they lay the basis by which electronic resources are availed, accessed, retrieved, and utilized. It is therefore reasonable to assume that the availability of basic facilities such as enough computers, reliable internet connectivity, and ICT infrastructures inspire library users such as postgraduate students to acquire digital literacy skills for identification, selection, retrieval, access, and utilization of electronic resources.

Regrettably, however, the ICT facilities in Kenya University libraries are inadequate and ineffective for digital library operations (Blakes, 2006). This has a potential negative impact on the use of ICTs to access and utilize electronic resources. As a result, Mugeru (2019) urges University management to continually improve and provide adequate ICT facilities to their libraries. This call to the university management lies on the premise that when organizations provide their libraries with enough ICT facilities to their clients, they not only provide an opportunity for training and developing the clients' proficiency in digital literacy but also provide the clients with an avenue for them to apply the acquired skills to access and use electronic resources that support modern teaching, learning, and research purposes. Similarly, the study concluded that there is need for policies and guidelines governing digital literacy training to encourage, equip and boosts skills of librarians and users

on use of ICTs to access and utilize electronic resources comfortably (Bartol et al., 2018).

2.3.3 Access and Use of Electronic Resources

Tamrakar and Garg (2016) remind us that the days when universities thrived only on print information resources for teaching, learning, and research are long gone. Today, the educational use of electronic resources has become very popular across diverse disciplines such that the service qualities of university libraries are now measured in terms of electronic collections. This has forced university libraries to acquire and provide access to electronic resources to effectively serve diverse users (Adeleke & Nwalo, 2017).

According to Jun and Pow (2011), effective exploitation, access, and use of electronic resources go hand in hand with digital literacy skills. Graham et al. (2003) describe electronic resources as the mines of information that are explored through modern Information and Communication Technology (ICT) devices, refined and redesigned, and more often stored in cyberspace in the most concrete and compact form and can be accessed simultaneously from infinite points by a significant number of audiences. Electronic resources include computer-based resources such as e-books, e-journals, e-conference proceedings, e-dictionaries, e-encyclopedias, e-newspapers, e-magazines, Online Public Access Catalogues (OPACs), e-manuscripts, e-maps, e-dissertations, e-research reports, among others (Odunewu & Aluko-Arowolo, 2018).

The provision of electronic resources in higher learning institutions is seen as a new way of gaining global access to research information (Alqudah & Muradkhanli, 2021). While libraries acquire most of their electronic resources through

subscriptions, Mole (2017) reminds us that Internet resources can provide information far beyond that available in the physical library's collection. This means that students are now exposed to quantities of electronic resources that are more cost-effective and provide adequate access to information that was previously not accessible or even known thereby widening the scope of higher education.

However, the complexity of electronic resources makes it necessary for postgraduate students to acquire digital literacy skills to effectively search, access, retrieve, and use online information from various electronic sources. Alqudah and Muradkhanli (2021) are of the view that the emergence of the Internet and other electronic sources of information have led to a shift from traditional methods of searching, retrieving, sharing, and disseminating information to the use of digital methods, which depend on the use of devices, digital literacy skills, and tools that are managed digitally. Therefore, postgraduate students must be digitally literate to navigate and effectively use electronic resources for various academic activities.

Ekenna and Mabawonku (2013) rightly stated that electronic resources are the bedrock of academic success as they provide accurate, up-to-date, and round-the-clock information for better educational outcomes and aid in the retrieval of the massive amount of information for teaching, learning, and research by students and staff who have the necessary digital literacy skills. Postgraduate students need digital literacy skills to make fair use of electronic resources. If these digital literacy skills are not there to enable them to navigate the Internet, their academic and research needs will suffer a setback.

According to Dadzie (2007), the benefits of electronic resources are invaluable because they serve as research tools that complement print-based resources in a

traditional library setting. Further, Dadzie outlined the benefits of electronic resources as access to information that might be limited to the user because of distance or finances and access to more current information. Lwoga and Sife (2018) agree that the application of information and communication technology in libraries and information services helps provide timely information in higher learning institutions to promote academic work and increase research productivity.

Nevertheless, despite the tremendous benefit and potentially massive advantages of electronic resources, access and use of electronic resources by postgraduate students come with a couple of challenges. Bola and Ogunlade (2012) conducted a study on students' accessibility and utilization of electronic resources, revealing that students skilled in using ICTs frequently use electronic resources, while those not highly skilled in using ICTs use electronic resources less frequently. Issa et al., (2009) investigated the effects of information literacy on the use of electronic resources among students of the University of Ilorin, Kwara State, Nigeria, and revealed that postgraduate students with higher skills in searching, accessing, and evaluating information sources were better users of electronic resources and that postgraduate student with high ICT skills were independent users of electronic resources while those with less ICT skill often require the assistance of librarians to use electronic resources.

According to Amankwah (2014), the use of electronic resources has been low in some African universities and attributed this situation to the lack of awareness of the availability of electronic resources, insufficient digital literacy skills, lack of formal training, and inadequate ICT infrastructure or poor e-information environments (Ani et al., 2014). However, these challenges can be addressed by improving the digital literacy skills of postgraduate students, expanding ICT facilities, and

intensifying awareness through training in the form of workshops, orientation programs, and seminars (Akussah et al., 2015).

2.3.4 Digital Literacy Training Programmes for Access and Use of Electronic Resources

Many authors infer a strong association between technological skill with digital tools usage, database resources usage, and networked information browsing. Ugwulebo and Okuonghae (2021) maintain that literacy training programmes on the use of technologies are the only way to improve and boost skills and competence for students, academicians, and information professionals to know how to use ICTs and networked technology to access and search for online information resources for quality learning, teaching and research.

Similarly, Muhinja (2013) believes that training users in ICT skills are essential and inevitably necessary for the effective usage of electronic resources. According to Constable (2007), training by librarians and ICT staff on using ICTs to access online information is an essential ingredient for helping postgraduate students gain and improve on skills and knowledge required for using electronic resources for academic purposes and to appreciate technology.

The growth of technology has had a significant impact on the performance of libraries and the training they offer on skills and competencies to use ICTs to support full-text searching, browsing, and improved usage of electronic resources. These trainings are significantly important to postgraduate students who depend on electronic resources for academic and research purposes. Bartol et al., (2018) affirm that digital literacy training encourages, equips, and enables librarians to develop skills and knowledge necessary for users to use ICT in utilizing electronic resources

comfortably. Eves and Dalziel (2007), deem librarians' information literacy training as helpful for adequate usage of electronic resources in academic libraries among postgraduate students. On the contrary, Okello-Obura and Magara (2008) opine that the inability to use electronic resources due to inadequate digital literacy and electronic resources training may result in shortfalls in research output, productivity, and performance. According to Udoh et al. (2020), digital literacy training is an alternative way for students, academic staff, and researchers to efficiently and effectively locate, access, evaluate, and use electronic resources to achieve their desired results.

Underscoring the significance of training, Tella and Mutula's (2008) work showed that postgraduate students who have received digital literacy and electronic resources training from librarians are motivated to access and use electronic resources readily. Similarly, Kari (2004) noted that users who are trained by librarians in online information searching and have adequate computer skills are more likely to access and use electronic resources productively and only a little assistance is provided to them. These observations suggest that inadequate digital literacy training is a limitation on access and use of electronic resources. Training forms part of the learning process as it empowers users (herein, postgraduate students) to have control of independent online searches and increases their confidence and morale to give them efficient and effective access to the needed information.

Ensuring continuous training rests not only on the library staff but also on the parent institutions. Mohammadyari and Singh (2015) indicate that an effective digital literacy training program requires the cooperative efforts of trained ICT experts, librarians, and lecturers to encourage and equip students with digital literacy skills for their scholarly and research work. Lecturers on their part need to learn and extend

new techniques using ICTs and integrate them into teaching and learning since they play an intermediary role in integrating ICT into the digital learning environment for academic purposes (Stork, 2017). Researchers concur that without lecturers' and librarians' support of modern teaching, learning and research access and use of electronic resources will not become a reality for achieving better academic objectives.

Yet, despite the rise of technology and its widespread adoption in society and educational institutions, postgraduate students' progress in digital literacy programs has lagged because institutions of higher learning have been slow to set up the necessary technological infrastructure in academic libraries for digital literacy instruction. (Mubarak & Nycyk, 2017). Subsequently, this study maintains the argument that for postgraduate students to harness the benefit associated with electronic resources databases, they need digital literacy training programs to gain and be equipped with digital literacy skills. All said, Bartol et. (2018) stressed for inclusion and regular provision of digital literacy education to all students of academic institutions to enhance learning performance.

2.3.5 Challenges facing Digital Literacy on Access and Use of Electronic Resources by Students in Higher Institutions of Learning

Anyim (2018) asserts that the acquisition of digital literacy skills is certainly a step in the right direction towards effectively utilizing electronic resources and services. The use of technology, application of digital literacy skills and the value of electronic resources in institutions of higher learning and safeguarding its access and usage are some notable impediments to postgraduate students in institutions of higher learning in Kenya quest to use technology and electronic resources for their academic work. These challenges reduce the extent to which the application of digital literacy skills

would have supported and promoted learning in institutions of higher learning through access and utilization of electronic resources by students, academic staff and researchers (Anyim, 2018).

The acquisition of digital literacy skills does not come without some challenges. In their view, Emiri (2017) and Salaam and Adegboro (2010) identified some factors that hinder librarians and users from accessing and exploring online information and these include poor information and technology facilities, lack of in-depth skills on how to search information materials, low literacy levels of the population, internet prohibition issues, power shortage problem and low or weak internet network. According to Udoh et al. (2020), despite the enormous usefulness of digital literacy skills acquired by students, the most disheartening scenarios in most of the institutions of higher learning and academic libraries in Nigeria and also applicable to the rest of Africa which were observed to hamper students' digital literacy skills in utilizing electronic resources included: inadequate digital literacy skills of students, lack internet facilities, epileptic power supply and non-functional or unusable digital tools such as computers in the academic libraries, and technophobic approach to digital technology by most undergraduate students.

The study by Mansour (2017) on survey of digital information literacy among academics and information professionals identifies lack of funds, training, physical facilities, connection to the internet, subscribing to e-databases, lack of time and library system regulations as some of the challenges affecting the library user and information professional's acquisition of digital literacy skills and related competencies necessary for access and use of electronic resources. A study carried out in Nigeria by Anjaiah (2016), found inadequate digital literacy skills of users, frequent power off, Wi-Fi problems while browsing electronic resources, limited

computer terminals in the library, and serious internet connection as factors mitigating digital literacy while browsing online resources. These findings collaborate with Ojeniyi and Adetimirin (2016) listing of factors hindering the digital literacy skills of the student in accessing and utilizing electronic resources as limited access to the computer, poor internet connectivity, erratic power supply, lack of technical know-how, technophobia, and difficulty using search terms.

Daly (2003) painted a worrying state of a myriad of the problems afflicting university education in Africa, particularly concerning the use of technology to access and use electronic resources which generally includes; technophobia, lack of requisite digital literacy skills to manipulate new technology to access and utilize electronic resources and reluctance to switch from traditional methods of teaching by academic staff to technological-oriented approaches. Based on extant literature on digital skills in the region, these factors still significantly undermine the benefits associated with technology in accessing and using electronic resources. These challenges may serve as destructive forces to deny postgraduate students the chance to access and use electronic resources effectively.

These scenarios are commonplace in Africa in general and in Kenya and some of them are applicable to Strathmore University Library. The findings of the study revealed that poor internet connectivity, power outages, digital literacy skills, limited subscribed titles from electronic resource databases, inadequate technological infrastructure, technophobia, outdated technology, information overload, inadequate digital technology training/practice, network delays, minimal assistance by the librarian, and embargo on some articles and passwords and user names on some of the electronic resource databases were some of the hindrances that significantly affect digital literacy skills of postgraduate students of Strathmore University in their

effort to access and use electronic resources. Although these challenges seem overwhelming, there are mitigation strategies that can be applied to counter them and enhance digital literacy skills to support access to and use of electronic resources

2.3.6 Measures to Enhancing Digital Literacy Skills to Support Access and Use of Electronic Resources

The advancement of technologies has strengthened the power and reach of electronic resources by students and academic staff with sufficient digital literacy skills. Blummer and Kenton (2015) rightly say: "In the new millennium, postgraduate students require information literacy as well as digital literacy skills to succeed in academia and beyond." Jun and Pow (2011) illuminate that digital literacy skills are crucial in the postgraduate students' access and utilization of electronic resources and offer a solution to some of the problems facing access and use of these print resources in a traditional library.

Digital literacy skills are empowerment skills and hold much potential for postgraduate students, academic staff, and researchers to access and utilize electronic resources, which transcend the institution's walls of learning to satisfy their information needs. Therefore, postgraduates must be equipped with these skills to assist them in doing their assignments, writing term papers, and conducting research. On the other hand, 21st-century education is technology-driven. As a result, academic staff must adapt and apply these technologies in their daily teachings since most institutions of higher learning have embarked on online education (Yo, 2021).

Electronic resources and digital literacy training by librarians are fundamental for helping postgraduate students gain desirable digital literacy skills necessary for using technology to access and utilize electronic resources. In their study, Tella and Mutula

(2008) state that students with higher computer literacy training are motivated to access and use electronic resources readily; therefore, inadequate training in digital literacy skills is a limitation on the use of electronic resources by postgraduate students.

Some general measures could include:

1. Training programs: Libraries organize training programs for students on digital literacy skills. These programs cover topics such as searching electronic databases, evaluating online sources, and citing electronic resources.
2. Workshops and seminars: Libraries also organize workshops and seminars on topics related to electronic resources and digital literacy. These events can be conducted by librarians or experts in the field.
3. Online tutorials and guides: Libraries develop online tutorials and guides to help students navigate electronic resources. These tutorials are made available on the library's website or through learning management systems.
4. Collaborations with academic departments: Libraries collaborate with academic departments to integrate digital literacy skills into the curriculum. This is done by working with faculty to develop assignments that require students to use electronic resources and providing support to students in accessing and using these resources.
5. Providing access to digital resources: Libraries provide access to a wide range of electronic resources, such as electronic journals, e-books, and databases. They also provide training on how to search and use these resources effectively.

2.4 Chapter Summary

This chapter aimed at making this research more credible by supporting it with works from authentic sources on what other scholars have researched on and written about the subject under investigation. The chapter has discussed in detail the Model of Student Digital Literacies by Beetham and Sharpe (2011) and the Horizontal Pyramid Model advanced by Ndubisi and Jantan (2003) based on the Technology Acceptance Model by Davis (1989) and their relevance to the study. This chapter has also reviewed the literature on digital literacy skills, the role of ICTs and digital literacy skills in facilitating access and use of electronic resources, the concept of electronic resources and digital literacy training programs. This thus leaves a gap to be filled through the research.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes various methodologies that were used to collect and analyse data, the methodologies refer to the following areas: research methods/approaches, research design, and the population of the study, sampling procedures, data collection techniques, data collection procedures, data analysis strategies, validity and reliability of data collection instruments and the ethical considerations. Bosire (2011) quotes Mikkelsen (2009) as saying that research is about knowledge production and seeking answers to questions through enquiry. She further says that there is no rule of thumb that tells a researcher precisely how to focus a study that there are choices among alternatives, all of which have merit. So the chapter explores these choices to ascertain those that will provide answers to the current study.

3.2 Research Methods

Research methods have been defined as comprehensive approaches to gathering evidence and analyzing specific problems, encompassing techniques and tools (Christensen et al., 2009). The concept technique is used to designate a practical way of collecting data and analyzing the information obtained in the research process. According to Creswell and Creswell (2017), research methods can be categorized into three, qualitative methods, quantitative methods, and the mixed methods. The three methods are discussed below.

- 1.) Qualitative method, is one in which the researcher makes knowledge claims based on constructivist perspectives. The researcher also employs inquiry strategies such as narratives, phenomenologies, ethnographies, grounded

theory, or case studies. The researcher collects open-ended data with the intent of developing themes from the data.

- 2.) Quantitative method, on the other hand is one in which the researcher uses post-positivist claims to develop knowledge, employ inquiry strategies such as experiments and surveys, and collect data on a predetermined instrument that yields statistical data.
- 3.) Mixed method is one in which the researcher tends to base knowledge claims on pragmatic grounds. It employs strategies of inquiry that involve collecting data either concurrently or sequentially to understand the research problem best. The data collection involves both quantitative and qualitative information.

The current study employed a mixed method approach where qualitative and quantitative methods were utilized to collect data that could answer the research problem comprehensively.

3.2.1 Mixed method

According to Creswell (2008), mixed method is a method and methodology for conducting research that involves collecting, analyzing, and integrating quantitative and qualitative research in a single study or a longitudinal inquiry program. The fundamental principle of mixed method research, according to Johnson and Turner (2003) and Greene (2007), is that multiple types of data should be collected utilizing various strategies and methods in ways that reflect complementary strengths and non-overlapping weaknesses in order to provide insights not possible when only qualitative or quantitative data is collected. More importantly, the mixed method combines qualitative and quantitative approaches to provide an all-inclusive analysis of the research problem. Johnson et al., (2007) pose the question: What is the reason

for using mixed methods? They offer the following answers as the reasons for using mixed approach:

- a) Insufficiency of quantitative or qualitative method itself;
- b) Different perspective from quantitative and qualitative approaches provide;
- c) Combined quantitative and qualitative provides more evidence.

The study used mixed method design which includes both quantitative and qualitative elements, to collect data from postgraduate students and library staff of Strathmore University. According to Leedy and Ormrod (2005), this method gives a more holistic picture of the phenomenon that is being evaluated. The qualitative research method brings subjective, descriptive, interpretive, and evaluative elements, while the quantitative research method brings the element of generalizing results from numerical data. With its benefits and limitations, these qualitative and quantitative elements are combined to complement each other's weaknesses. According to Johnson et al., (2007), mixed methods research attempts to legitimize multiple approaches in answering research questions rather than restricting or constraining the researcher's choices by rejecting dogmatism.

The characteristics of the postgraduate student population and librarians at Strathmore University make the mixed-method approach appropriate for investigating the application of digital literacy skills to access and use electronic resources. Postgraduate students typically exhibit diverse levels of digital literacy, shaped by their different academic backgrounds, fields of study and prior exposure to technology. The qualitative component of the mixed-method approach, such as interviewing librarians provides in-depth understandings into these experiences and helps explain the "why" behind the patterns observed in the quantitative results,

providing a deeper understanding of the students' experiences. The mixed-method approach is ideal for Strathmore University Library as a case study, where unique institutional factors, such as resource availability and support systems and training, play a role in shaping the postgraduates experience.

This research study employed such techniques as administering questionnaires to postgraduates and using interview schedules to library staff during data collection. The study was based at Strathmore University Library and mixed method was found suitable for this study because it allowed for in-depth investigation into the selected case with regarding to collecting qualitative data from library staff (key informants) and quantitative data from postgraduate students who most of the time access and use electronic resources. Qualitative data was collected concurrently with quantitative data in order to provide a comprehensive analysis of the research problem by integrating both forms of data to interpret the overall results thus the current study adopted a concurrent parallel design.

Concurrent parallel design offers a comprehensive understanding of how postgraduate students apply their digital literacy skills to access and utilize electronic resources and how library staff perceives and support this process. According to Almeida (2018), key features of this approach include simultaneous data collection, independent data analysis, integration of results and complementary findings, all of which make it highly applicable to this study. Simultaneously, quantitative data is gathered through structured surveys administered to postgraduate students and, qualitative data is collected through interviews or focus group discussions with library staff, providing rich, detailed understanding into staff perspectives on application of digital literacy skills.

The triangulation of results occurs at the interpretation stage, where findings from both the quantitative and qualitative data are compared and merged to provide a holistic view of problem under investigation (Almeida, 2018). The quantitative findings give a broad understanding of the extent to which digital literacy skills are applied by postgraduate students, while qualitative understanding provide deeper context, explaining why certain patterns exist and identifying potential solutions. This integration ensures that the study benefits from the strengths of both methods generalizability from the quantitative data and depth from the qualitative data resulting in a more complete and exact understanding of digital literacy application at Strathmore University Library.

3.3 Research Design

A research design is a strategy for attaining research objectives and answering research questions (Cooper & Schindler, 2011). The strategy includes the research structure and outlines the researchers' plan from the initial stage of stating the problem statement and its implications to the final data analysis. The research design also specifies the research methods chosen to determine the information needed as well as defines the sampling method, sample size, measurement, and data analysis processes (Zikmund, 2003).

Creswell (2013) and Kothari (2004) explain that different research designs relate to philosophical assumptions and research methods; for instance, research designs associated with post positivism and bring into play quantitative methods are descriptive, correlate, experiment, survey, and comparative. Similarly, research design associated with the social constructivism paradigm and brings to play qualitative method are ethnographic, phenomenological, grounded theory, case studies and narrative. Finally, the research design associated with a pragmatic

paradigm that invokes mixed methods is, concurrent parallel design, explanatory sequential design, exploratory sequential design, and embedded design (Creswell and Plano Clark, 2011; Creswell, 2012). Morse et al., (2006) advance the view that qualitative and quantitative components may be performed concurrently or sequentially in mixed methods, and emphasis may be placed on either component or equal weight. Survey design was applied within a case study where it was suitable to help collect data from a large number of postgraduate students, providing a broad understanding of how postgraduates apply digital literacy skills to access and use electronic resources. The survey provides measurable, quantitative data that can be analyzed statistically to identify trends, common issues and correlations (Creswell, 2008). A case study focuses on in-depth exploration within a specific context, being Strathmore University library allows the researcher to investigate how institutional factors, like ICT infrastructure and support systems influence postgraduates ability to apply their digital literacy skills. The integration of quantitative data from the survey with qualitative understandings from the case study creates a comprehensive approach, ensuring that the findings are both generalizable to broader contexts and specific to the unique environment of Strathmore University Library. The mixing of the two designs provided a better understanding of the research problem because it is utilized and built on the strengths of both quantitative and qualitative data (Creswell, 2008; Saunders, Lewis, and Thornhill, 2012).

3.4 Population of the Study

A study population refers to a group of individuals, objects or items from which samples are taken for measurement (Kombo, 2006). It also refers to an entire group of persons or elements with at least one thing in common (Kombo, 2006), for example, the total student population (undergraduate and postgraduate students) and

the entire library staff of Strathmore University. According to Strathmore Graduates Studies (SGS), postgraduate graduate office statistics for 2017/2018 SU had a population of 776 postgraduates and 14 library staff based on the information available at the Strathmore Registrar's Office and Human Resource Office. Greene (2007) has defined the concept of the population clearly as any group that is the subject of the research interest. The target population is the entire population or group that a researcher is interested in researching and analyzing.

The target population was chosen because they formed groups that are expected to acquire digital literacy skills to make considerable use of electronic resources to meet their information needs while undertaking their studies and undertaking their research. Furthermore, there is a section within the Strathmore University Library (postgraduate lab) specifically for postgraduate students to access electronic resources. The library staff was targeted as key informants due to the nature of their job of being the custodians and implementers of policies for access and use of electronic resources in the library, offering information and digital literacy training to library users as well as ensuring smooth daily operation of the library.

Table 3.1: Target Population of Key Informants

Category	Population
University Librarian	1
Deputy University Librarian	1
Systems Librarian	1
Senior Library Assistant	2
Reference Librarian	2
Library Assistant	7
Total	14

Source: (Strathmore University Registrar's office Human Resource office 2018)

Table 3.2: Target Population of Postgraduates at Strathmore University per Programme

Academic program	Population
Master of Science in Information Technology	69
Master of science in Biomathematics	23
Master of Commerce	137
Master of Science in Information Systems Security	103
MBA for Executives	324
Master's in Public Policy and Management	47
Master of science in Information practice for Academics	14
Master of Applied Philosophy and Ethics	11
Master of Science in Mathematical Finance	7
Master of Science in Computer- based Information Systems	12
Master of Science in Education Management	14
PHD	15
Total	776

Source: (Strathmore Graduates Studies (SGS) Postgraduate Statistics 2017/2018)

University Librarian: Is the overall manager of the library, charged with policymaking, and responsible for Library sections/departments. The university librarian has experience with selection, electronic resources acquisition, collection, preservation, institutional repositories, data access, sharing, intellectual privacy, and trusted leadership and overall management of the library.

Deputy University Librarian: Deputizes the role of University Librarian and assists in management of the library, policymaking, and responsible for library sections/departments.

Systems Librarian: Responsible for IT section/department within the library and in charge of implementing cyber infrastructure to acquire computers, servers, LAN cables, and wireless networks for accessing the internet to support access, use, and downloading electronic resources. Systems Librarian also ensures that there is reliable internet connectivity within the library and plays a part in the digital literacy training of staff and students.

Senior Library Assistant: They support both University Librarian and the Deputy University Librarian with the library's daily operations and play a critical role in the users' awareness of electronic resources and digital literacy training for all library users and staff.

References Librarian: Responsible for identifying and interpreting user needs; providing reference, readers' advisory, computer, database, and referral services to library patrons directly and by telephone; and assisting patrons in material selection. They are also responsible for training users on how to access and use electronic resources in the library, and they play a significant role in the library's daily operations.

Postgraduate students: They are expected to acquire digital literacy skills to make considerable use of electronic resources to meet their information needs while undertaking their studies and research. To this end, it can be noted that the above respondents play a significant role in the study.

3.5 Sampling Procedure

Mugenda and Mugenda (1999) define sampling as the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected. The primary purpose of sampling is to get a representative sample from a much larger population, study it and produce accurate generalizations about the larger group. Teddlie and Tashakkori (2009) posit that in selecting a sample to study, it should represent the full set of cases in a meaningful and justified way.

The study employed probability and non-probability sampling methods. Probability sampling is sampling in which each of the members of the population has an equal

chance of being included in the sample and also draws representatives from a wider population and thus, allows the researcher to make generalizations from the study's findings (Cohen & Manion, 2011). At the same time, non-probability is when the researcher deliberately chooses those to be included in the sample frame because of some special interests and also to enable the researcher to focus on in-depth information collection to help to draw some meaningful summaries from the information collected. The following sampling procedures were adopted for the study:

3.5.1 Stratified Sampling

Stratified sampling techniques were used to categorize the respondents to be included in the sample. A stratified sampling technique is used to identify subgroups in the population and their proportions and select from the respondents' sub-groups to form a sample size. Stratified sampling was used to ensure that the target population was divided into different strata, and each stratum is represented in the sample. The postgraduate students were first categorized according to their academic programmes they undertake. The sampling frame used for simple random sampling included key information such as the academic programme being undertaken by the postgraduate students which ensured each individual has an equal chance of being selected. Once the sampling frame was established a sample was taken from each of these strata using simple random sampling.

3.5.2 Simple Random Sampling

According to Huges (2008), a simple random sample is often obtained by choosing elementary units so that each unit in the population has an equal chance of being selected. Simple random sampling was used to select individuals in the various academic programmes to participate in this study. According to Bhattacharjee

(2012), each member of the population had an equal chance of being selected as a subject. A simple random sampling of the population was adopted because it was not possible to survey the entire population because of budget and time constraints.

3.5.3 Purposive Sampling

Kerlinger (1986) defines purposive sampling as the use of judgment and deliberate effort to obtain a representative sample by including typical presumable areas of the group in the sample. The researcher selected subjects to participate in the study based on identified variables under consideration, which is preferred due to their effectiveness in addressing the study's research problem. The study employed a purposive sampling technique because it allowed for the selection of information-rich cases, which allowed those understudies to clarify the questions under the study. Library staff are the intermediaries who train users to access and use electronic resources in the library, and therefore were the key informants in this study, hence were purposively selected. The key informants included; 1 University Librarian, 1 Deputy University Librarian, 2 Senior Library Assistant Librarians, 1 Systems Librarian, and 2 Reference Librarians. The key respondents were purposefully sampled because of the nature of their jobs and relevance of the information they hold in regard to making policies and decision in the library.

3.6 Sample Size

Kothari (2011) defines sample size as the number of subjects to be selected from the universe to constitute a sample. Cooper and Schindler (2011) define a sample size as the number of elements used to represent the total population. The sample must be a representation of the entire population. Hence determination of the sample size that is representative is a very important matter for collecting accurate results.

Harwell (2011), thinks that the statistical determination of appropriate sample size can be generalized to represent the entire target population. In determining the sample size for this study, the sample ratio proposed by Neuman (2007) indicates that for a small population of less than 1000, a researcher needs a sampling ratio of 30%. In line with Neuman (2007) principle, the researcher drew a sample of 30% of 776 of the entire target population of postgraduate students to get 233 respondents to whom questionnaires were administered. Meanwhile, out of the 14-library staff, the researcher purposively sampled one (1) University Librarian, one (1) Deputy University Librarian, two (2) Senior Library Assistant Librarians, one (1) Systems Librarian and two (2) Reference Librarians.

A sample size of 233 postgraduates was determined using the formula below, thus:

$$\frac{30}{100} \times 776 = 233$$

Neuman's (2007) sample size formula was used to determine the proportionate sample size for each postgraduate course being undertaken. To get the proportionate sample size, the proportionate sample formula is;

$$PS = \frac{\text{Total student population for postgraduates per course}}{\text{Total student population}} \times 233$$

Where PS = Proportionate sample size.

Table 3.3: Sample Size of Postgraduates at Strathmore University per Programme

Academic program	Population	Sample Size
MSc. IT	69	21
MSC.B	23	7
MCOM	137	41
MSc. ISSS	103	31
MBA for Executives	324	97
MPPM	47	14
MSc. IPA	14	4
MAPE	11	3
MSc. MF	7	2
MSC.CIS	12	4
MEM	14	4
PHD	15	5
Total	776	233

Source: SU (April 2018)

Table 3.4: Sample Size for Library Staff who are the Key Informants

Category	Population	Sample size	Percentage
Library Staff	14	7	50%
Total	14	7	50%

Source: SU (April 2018)

3.7 Data Collection Instrument

According to McLaughlin (2016), data collection is a systematic approach to gathering and measuring information from various sources to get a complete and accurate picture of an area of interest. Various tools can be used to collect data, including questionnaires, interviews, focus group discussions, documentary review, and observations among others. The researcher identified the suitable tools for the study that were required to answer the research questions. Oadini (1999) assures that an appropriate tool could collect information economically within the available time. However, due to the nature of the information being sought on the target respondents and the population size of Strathmore University, the study employed questionnaires to collect quantitative data from postgraduates and interview schedules to collect qualitative data from library staff who were the key informants.

3.7.1 Interview

Interviews play a vital role in information gathering. The objective of the interviews was to obtain information relating to digital literacy skills on access and use of electronic resources, especially regarding postgraduate students and library staff and the challenges and strategies presented by electronic resources, and how these can be dealt with in the future.

Keith (2005) notes that interviews are one of the leading ways of assessing respondents' perceptions, attitudes, views, and definitions of situations and construction of reality; hence are one of the primary data collection tools in qualitative research. The interview was helpful to the researcher in the sense that highly personalized data such as personal experience was attained; probing opportunities and a reasonable return rate were achieved.

The researcher conducted a one-on-one interview with library staff (informants) taking notes in the process. This method made it possible to gather more information that is valid and reliable, and relevant to the research objectives of the study. By use of structured and semi-structured interviews, the researcher sought to gather information to enable him to have a better perspective of the status of digital literacy skills on access and use of electronic resources, especially regarding postgraduate students and library staff at Strathmore University.

Odini (1999) assures that face-to-face interviews yield a high percentage of returns as everyone on a list can be reached. Again, the researcher was able to elicit a more in-depth response or explain or clarify a question if a participant did not understand a question. The main advantage of the face-to-face interview was the presence of the

researcher, which made it easier for library staff to either clarify answers or ask for clarification.

3.7.2 Administration of Questionnaires

Babbie (2007) defines a questionnaire as "a document containing questions and other types of items designed to solicit information appropriate for analysis." The fundamental objective of a questionnaire is to obtain facts and opinions about a phenomenon from people who are informed on the particular issue. Questionnaires may be refined or validated during the research project they were designed for and may become the basis of a future scale (De Vos et al., 2011). The data was collected through structured and semi-structured questionnaires to obtain data from postgraduate students of Strathmore University, which were developed by the researcher based on the research objectives. The questionnaires constituted both open and closed-ended questions.

The questionnaires were subdivided into two main sections; the first dealt with general information and the second with factors dealing with digital literacy skills on access and use of electronic resources by postgraduate students. As earlier mentioned, the researcher used structured or closed-ended questionnaires to collect data from students due to the advantage that closed-ended questions give the respondents a list of all possible alternatives, thus giving the respondents complete freedom of response. It is also the case that structured or closed-ended questionnaires are easier to analyze and administer since each question is provided with alternative answers. They are also economical to use in terms of time and money.

The respondents were also allowed to express their views in the open-ended questions regarding addressing the concept under study. Assistance from library staff

also helped the researcher to minimize the loss of control of questionnaires sent out. Quantitative data was collected from the structured questions, while qualitative data was collected from the open-ended questions. The open-ended questions offered the respondents the opportunity to respond in their own words and express their perspectives (Patton, 2002).

3.8 Data Collection Procedures

After successfully defending the proposal and with the acknowledgment of supervisors to go ahead, the researcher sought a research permit from the National Council for Science Technology and Innovation to carry out the research. In addition, clearance was sought from the head of research and policy development at SU and the Institutional Research and Ethics Committee to increase the respondents' confidence to participate in the research freely. Interviews were booked one week in advance with the library staff. Interviews were done through physical visits to the selected staff offices.

The researcher wrote a letter of introduction to Strathmore University seeking permission to research the factors contributing to the low usage of electronic resources by users of SUL and their participation in filling questionnaires. The letter informed postgraduates about the purpose to which the research was intended and also gave assurance on the confidentiality of information that they would provide during the study. Equally, the potential respondents were informed of their right to decide to participate or decline participation in the study.

3.9 Validity and Reliability of the Data Collection Instruments

Traditionally, researchers (Babbie & Mouton, 2010; Creswell 2014) associate reliability and validity to the quality of a study and importantly in establishing the

truthfulness, credibility, or believability of findings. Validity refers to the extent to which data collection methods accurately measure what they were intended to measure (Saunders et al., 2012) Reliability on the other hand is defined by Saunders et al. (2012) as the ability of the data collection techniques and analytic procedures to produce consistent findings if they were repeated on another occasion or if they were replicated by a different researcher.

3.9.1 Validity

According to Sarantakos (2005), validity tells the researcher whether an instrument measures what it is supposed to measure and whether this measurement is accurate and precise. Validity, therefore, is concerned with whether the research is believable and true and whether it is evaluating what it is supposed or purports to evaluate.

Babbie and Mouton (2010) posit that validity is the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration. Basically, it refers to the effectiveness of an instrument in measuring the specific property which it intends to measure and the degree to which the results obtained represent the phenomenon under study.

Generally, the researcher used two instruments (questionnaires and interview schedule) to collect data. These instruments' quality was critical because the conclusions the researcher drew were based on the information obtained using these instruments. Thus, the instruments needed to be validated. This was done by preparing questions that would measure application of digital literacy skills by postgraduate students to access and use of electronic resources. Questionnaires and interview schedules were formulated according to the objectives.

3.9.2 Reliability

Reliability is defined by Saunders et al. (2012) as the ability of the data collection techniques and analytic procedures to produce consistent findings if they were repeated on another occasion or if they were replicated by a different researcher. Reliability deals with the consistency, dependability and reliability of the results obtained from a piece of research (Creswell, 2014).

Obtaining similar results in quantitative research is relatively straightforward because data are in numerical form. However, in qualitative approaches to research, achieving identical results are fairly complex as the data are in narrative form and subjective. Creswell (2014) points out that instead of obtaining the same results, it is better to think about the dependability and consistency of the data. In this case, the purpose is not to attain the same results but rather to agree that the findings and results are consistent and dependable based on the data collection processes.

To ensure validity and reliability, the researcher provided a clear explanation of the techniques used to collect needed data; clear and pleasing layout of designing of questionnaires and interview schedules; careful design of individual questions; simple explanation of the purpose of the research; pilot testing; carefully planned and executed administration (Saunders et. al., 2018; Simon, 2011).

In the present study, validity and reliability were assured through the following methods:

- **Pilot Study:** In order to attain validity and reliability in the present study, a pilot study was carried out. Thus, piloting was crucial in the present study because it helped the researcher to test the questions, establish whether the sampling frame and technique are effective, and gain some practice in

administering questionnaires and interviewing (Van Teijlingen and Hundley, 2010). Pre-testing of the data collection instruments was carried out at Moi University Margaret Thatcher library to prevent contamination which would occur if the same participants in the main study are included in the pilot study (Van Teijlingen and Hundley, 2010). The library was selected for a pilot study due to the fact that the library subscribes electronic resource databases, has acquired computer-based technologies and has a section offering information literacy training. Questionnaires were administered to (15) postgraduate students and interview schedules were administered to (5) staff library. The concerns of the respondents were addressed before the researcher administered the interviews. Therefore, suggestions from the respondents and experts were used to shape and adjust the final instruments that were used to suit the research problem;

- **Triangulation:** Triangulating of data sources by collecting data from postgraduate students and library staff. Responses from all these groups were compared and the response with the highest frequency from all the groups was taken to be the true reflection of the matter at hand. Methods of data collection were also triangulated to provide a basis for convergence on the truth (Polit and Beck, 2004). The study used questionnaires and interviews to collect data that addressed similar aspects of the research problem. Patton (2002) supports this view by indicating that the use of triangulation strengthens a study by combining methods.

Peer debriefing: The reliability of the tools was improved by peer debriefing which according to Polit and Beck (2004) exposes components of research to a critical review by other researchers who could be experienced in either the

methods of naturalistic inquiry, the phenomenon being studied, or both. In this case, questionnaires and interview schedules were scrutinized by the researcher's supervisors of the School of Information Sciences at Moi University.

3.10 Data Presentation and Analysis of Findings

Data was collected using questionnaires and interview guide. A set of descriptive statistics was used to explain and summarize the properties of data collected from the respondents via the questionnaires. These were interpreted by the use of tables, graphs, and percentage distribution of items related to the objectives. The survey questionnaire and interview schedule were used to collect data, as reflected in Table 3.5, which provided a summary of the mapping of the research question to data sources, respondents, and the data analysis strategy.

Table 3.5: Mapping Research Questions to Sources of Data and Data Analysis Strategy

Research question	Data sources	Respondents	Data analysis Strategy
What level of digital literacy skills do postgraduate students possess and how does it support access and use of electronic resources?	Interview schedule Survey questionnaire	Library Staff Postgraduates	Qualitative data: thematic analysis Quantitative data: thematic: SPSS and analysis (open ended questions)
How does application of ICTs and digital literacy facilitate effective access and use of electronic resources in SUL	Interview schedule Survey questionnaire	Library Staff Postgraduates	Qualitative data: thematic analysis Quantitative data: thematic: SPSS and analysis (open ended questions)
How adequate are the digital literacy training programmes for postgraduate students in facilitating access and use of electronic resources?	Interview schedule Survey questionnaire	Library Staff Postgraduates	Qualitative data: thematic analysis Quantitative data: thematic: SPSS and analysis (open ended questions)
What are the challenges experienced by postgraduates concerning digital literacy skills on access and use of electronic resources and what are the remedies for the challenges at Strathmore University library?	Interview schedule Survey questionnaire	Library Staff Postgraduates	Qualitative data: thematic analysis Quantitative data: thematic: SPSS and analysis (open ended questions)

3.11 Ethical Consideration

Because the study involved human beings, it was important to make them understand that the study is for academic purposes; hence it will not cause them physical or psychological harm by, for example, changing their behaviour. They were also informed that the study was not an attempt to cause them pain or distress. Based on background and understanding, the issues to be considered were to protect participants from harm, seek informed consent, and assure them of the right to privacy and honesty. The following are some of the issues that were being taken into consideration before embarking on the study:

The researcher took the following actions,

- a) The researcher sought permission from NACOSTI, as they are the scientific authority in Kenya, to conduct research within the country in the academic and research institutions. NACOSTI issued a research permit.
- b) The researcher sought Strathmore University's (Research office) consent to conduct research in the institution.
- c) The researcher sought consent from the subjects to voluntarily participate in the research and assured them that their privacy rights would be guaranteed. In case of unwillingness to give certain information, this right would be treated respectfully. The subjects were informed in advance about the purpose of the study and the relevance of their participation in the study.
- d) The participants were assured of confidentiality concerning their information that it was guarded and data collected was to be used for the stated purpose, and no other person would have access to the information whatsoever.

- e) Acknowledging sources, the research acknowledged sources and citation as is essential aspect of academic research and reflects the integrity and credibility of the researcher.

3.12 Chapter Summary

This chapter has presented the methodology that the study employed in data collection and analysis. Justification for every step taken has also been provided. Data analysis and the ideas of this chapter helped ensure that the approaches taken in the study relating to data collection, analysis, and presentation adequately served the aim and objectives of this study. The procedures given by the chapter were also vital in ensuring the observance of ethical concerns in the research throughout this particular study.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

Marshall and Rossman (1999) describe data analysis as the process of bringing order, structure, and meaning to the mass of collected data and further described it as messy, ambiguous and time-consuming, but also as a creative and fascinating process. This study applied mixed methods that enabled the researcher to collect quantitative data from a large sample of postgraduate students of Strathmore University and qualitative data from the Strathmore University Librarian, Deputy University Librarian, Reference Librarian, Systems Librarian, and Senior Library Assistant. Mixed method ensures that data collected through one method can be validated using the other method (Creswell et al., 2011). The purpose of the study was to investigate the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University Library with the view to proposing interventions to improve digital literacy skills on access and use of electronic resources.

The purpose of this chapter is to present and analyze data gathered from the respondents as per the objectives of the study. The objectives were as follows:

1. To investigate the level of digital literacy skills on access and use of electronic resources by postgraduate students;
2. To examine the application of ICTs and digital literacy skills in facilitating adequate access and use of electronic resources.
3. To find out the type of digital literacy training programmes in place for postgraduate students in facilitating access and use of electronic resources;

4. To identify challenges faced by postgraduate students concerning digital literacy skills on access and use of electronic resources and suggest ways of improving digital literacy skills to facilitate access and use of electronic resources.

Therefore, this chapter analyzes the respondents' opinions as gathered on the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University Library, Kenya. The collected data were presented and analyzed form of text, tables, pie charts, and percentages. According to Neuman (2007), frequency tables and graphical representations are common methods of data presentation. Apart from the use of tables, other figures were also used to vary the presentation of data. Percentages were rounded up to one decimal place. Data from questionnaires and interviews were analyzed concurrently to enable the researcher to collate research findings from both data collection instruments. In some cases, phrases and terms used by respondents are indicated.

4.2 Response Rate

Response rate is the total number of respondents who participated in the study, and it is presented in percentages. Out of 233 sampled postgraduate students, 184 completed and returned the questionnaires giving a 79% response rate, while 5 out of 7 key informants were interviewed, representing 71 % of the response rate. Gaining access to some key informants, especially the ones from the late shift, proved difficult because of their busy schedule, thus the above response rate. The response rate was considered adequate based on Mugenda and Mugenda (2008), who observed that a 50% response rate is adequate, 60% is good and above, while 70% is rated very well; therefore, this was considered a good representation of the population. According to Riolo et al., (2005), a response rate of 80% is recommended, and for

this study, the average response rate is 78.8% which is within the recommended threshold.

Table 4.1: Summary of Response Rate Respondent N=240, n=189

Category	Sample Size (N)	Response Rate (n)	Response Rate (n%)
Postgraduates (Questionnaires)	233	184	79
Key Informants (Interviews)	7	5	71
Total	240	189	78.8

Source: Field data (2018).

Two hundred and thirty-three (233) self-administered questionnaire copies were distributed among postgraduate students, but only 184 (79%) were returned. For face-to-face interviews with the library staff, out of the 7-library staff, only 5(71%) were interviewed. The expected number of interviews was not met due to the interviewees' busy schedules, preventing the researcher from interviewing them.

Table 4.2: A Response Rate of Postgraduate Students and Library Staff at Strathmore University

The target group of postgraduates per Academic program	Sample size (N)	Response rate (n)	Response rate in (%)
Master of Science in Information Technology	21	16	66.7
Master of Science in Biomathematics	7	4	57.1
Master of Commerce	41	33	80.5
Master of Science in Information Systems Security	31	23	74.1
MBA for Executives	97	83	85.6
Master's in Public Policy and Management	14	11	78.6
Master of Science in Information practice for Academics	4	2	50
Master of Applied Philosophy and Ethics	3	1	33.3
Master of Science in Mathematical Finance	2	1	50
Master of Science in Computer-based Information Systems	4	4	100
Master of Science in Education Management	4	3	75
PHD	5	3	60
Questionnaire response rate	233	184	79%

Interviews Response Rate from Key Informants			
Interviews	Sample size (N)	Response rate (n)	Response rate in (%)
University Librarian	1	1	100
Deputy University Librarian	1	1	100
System Librarian	1	1	100
Reference Librarian	2	1	50
Senior Library Assistant	2	1	50
Interview response rate	7	5	71%

Interviews: N=7; n=5. Questionnaire: N=233; n=184.

Source: Field data (2018).

The high response rate was attributed to the persistence reminders and follow-ups by the researcher and assistance from library staff and staff of the Strathmore Graduates Studies (SGS) Department.

4.3 Demographics Characteristics of Respondents

This section of the questionnaire aimed to gain background information from the respondents. Questions 1 to 8 determined the gender, age, level of education, length of usage of library, the position of the key informant, working experience of library

staff, highest academic qualification of library staff among others. The profile of the respondents was essential to determine the correlation between variables on digital literacy skills and the use of electronic resources.

4.3.1 Postgraduate Students Demographics Characteristics

4.3.1.1 Gender

The study showed more male postgraduate students, 98 (53.3%), than female postgraduate students, 86 (46.7%) represent the gender of participating postgraduate students.

4.3.1.2 Age of Postgraduate Students

The most common age category into which most respondents fell was between the ages of 26 and 30 years being 84 (45.7%), 43 (23.4%) respondents were of the age between 31 and 35 years, 40 (21.7%) of the respondents were between 36 and above years, and finally 17(9.2%) of the respondents were between the age of 20-25 as depicted in Figure 4.1 below.

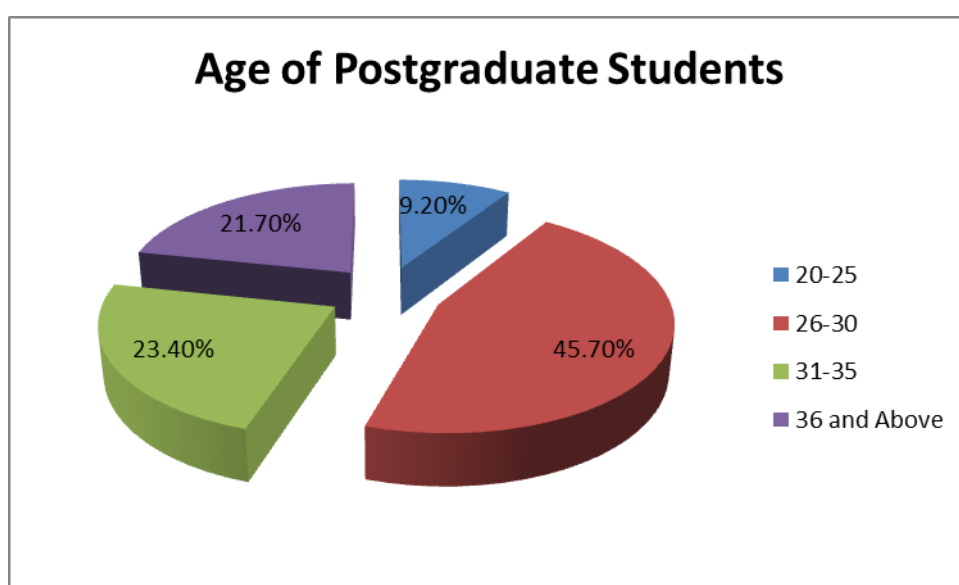


Figure 4.1: Age of Postgraduate Students
Source: Field Data (2018).

4.3.1.3 Level of Education

Education level was significant to be analyzed because it helped ascertain whether it affects postgraduate students' digital literacy skills on access and use of electronic resources and understanding of how postgraduates can use technology to search, retrieve and use online resources. Respondents were asked to indicate their levels of education at the time of the study. The majority of the respondents, 178 (97.0%), were pursuing masters degree, while the remaining 6 (3.0%) were Ph.D. students, as shown in table 4.3.

Table 4.3: Level of Education Currently Being Undertaken by Postgraduate Students (n= 184)

Level of Education	Respondents	Percentage (%)
Masters	178	97
Ph.D. (Doctoral)	6	3
Total	184	100%

Source: Field data (2018).

This finding reveals that SU has more students undertaking Master's Degree programs than Ph.D. programs. This was of great importance because education level is assumed to have a direct connection to digital literacy levels on access and use of electronic resources.

4.3.1.4 Year of Study

Further, the respondents were asked to indicate their various years of study that at the time of study, and the findings are as shown in figure 4.2.

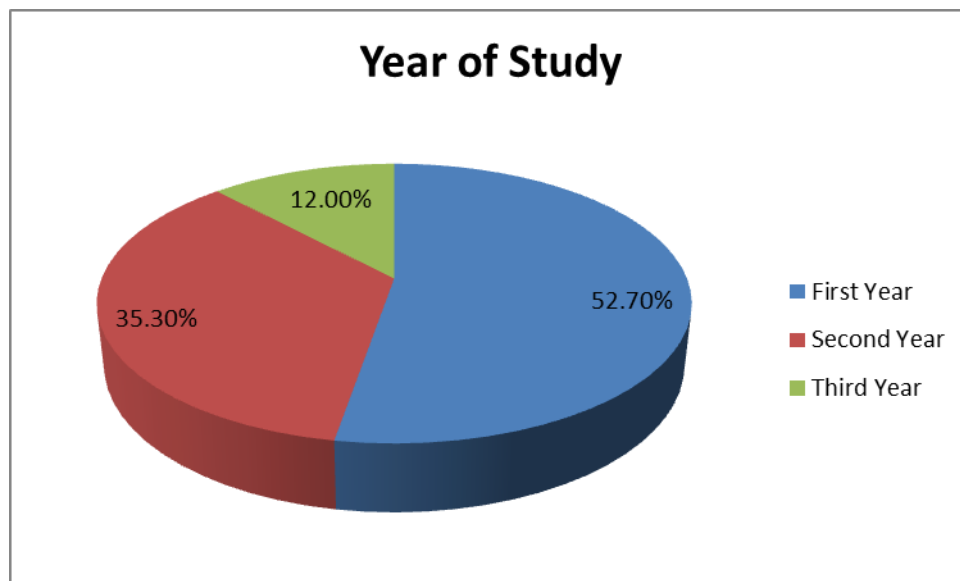


Figure 4.2: Year of Study
Source: Field Data (2018)

It can be seen that majority of respondents, 97(52.7%), were in their first year of study, 65(35.3%) in their second year, and 22(12%) in their third year of study.

4.3.1.5 Nature of Study

There was a higher number of full-time than part-time students. The majority of respondents, 93 (50.5%), indicated that they were full-time students, while 91 (49.5%) respondents indicated they were part-time students. The results are illustrated in figure 4.3.

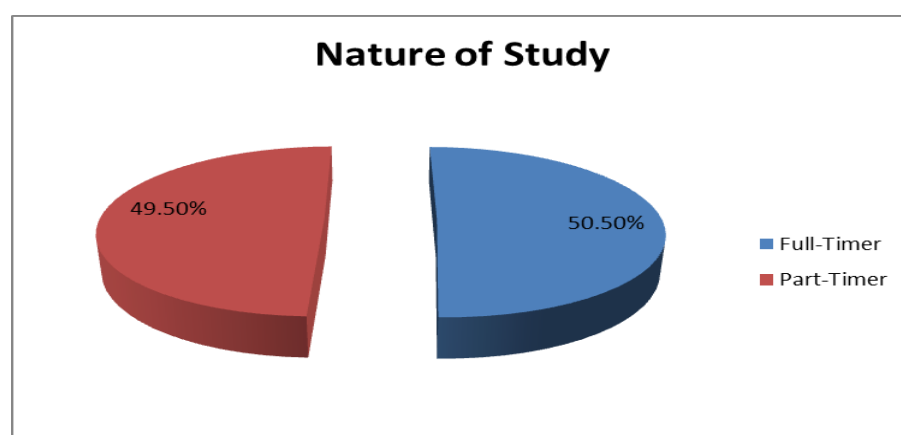


Figure 4.3: Nature of Study
Source: Filed Data (2018).

4.3.1.6 Duration of Usage of the Library by Postgraduate Students

The study sought to establish the period that the postgraduate students have been using the library. The purpose was to determine if the library plays a significant role in their academic journey. From the questionnaires distributed, 108 (58.7%) indicated that they had used the library for one year, while 58 (31.5%) of the respondents had been using it for two years, while 12 (6.5%) of the respondents had been using it for three years and 6(3.3%) had used the library more than four years as shown on table 4.4.

Table 4. 4: Duration of usage of the library by Postgraduate Students (n= 184)

Duration	Respondents	Percentage (%)
One Year	108	58.7
Two Years	58	31.5
Three Years	12	6.5
More than four years	6	3.3
Total	184	100

Source: Field Data (2018).

4.3.2 Key Informants (Library Staff) Demographics Characteristics

4.3.2.1 Job-Status Position of Key Informants (Library Staff)

The study required the respondents to indicate their job status at Strathmore University Library. The respondent's current job status is reflected in Table 4.5

Table 4.5: Current Job Status of Respondents (n=5)

Position	Frequency	Percentage (%)
University Librarian	1	20
Deputy University Librarian	1	20
Reference Librarian	1	20
Systems Librarian	1	20
Senior Library Assistant	1	20
Total	5	100

Source: Field Data (2018).

Table 4.5 shows that 1 (20%) of respondents was a University Librarian, Deputy University Librarian, and Librarian, while 2 (40%) were Senior Library Assistants.

4.3.2.2 Work Experience of Library Staff

Concerning work experience by the librarians, the study sought to establish the period during which the librarians were employed at the Strathmore University Library. The purpose was to find out how experienced they are regarding awareness, assistance, and training received in using ICT, especially accessing and using the internet and electronic resources. Of the interviewed staff, 1 (17%) of the respondents had been in employment for less than one year, while 4 (83%) of the respondents had been in employment for more than 4 years, indicating that the library is rich in terms of experienced and qualified staff.

4.3.2.3 Highest Qualification of Library Staff

Most of the respondents, 3 (60%) of the library staff, held Masters Degree qualifications. The remaining 2 (40) % of respondents were split with 1 (20%) respondents holding doctorates and the same percentage holding postgraduate diplomas, and none of them had a diploma or certificate.

4.4 The level of digital literacy skills on access and use of electronic resources by postgraduate students

The level of digital literacy skills are crucial in facilitating access and use of online information needed by postgraduate students in academic libraries to pursue their daily academic pursuit for their scholarly work by effectively searching, accessing, and retrieving information for assignments, research articles writings, thesis writing and other daily academic routines.

4.4.1 Level of Digital Literacy Skills of Postgraduate Students

One of the objectives of this study was to investigate the level of digital literacy skills by postgraduate students to access and use of electronic resources at Strathmore University. The researcher had assumed that limited digital literacy skills

of users, lack of computer skills, and searching skills lead to underutilization of electronic resources by postgraduate students. The study, therefore, endeavoured to establish the different levels of digital literacy skills on access and use of electronic resources, as shown in figure 4.4.

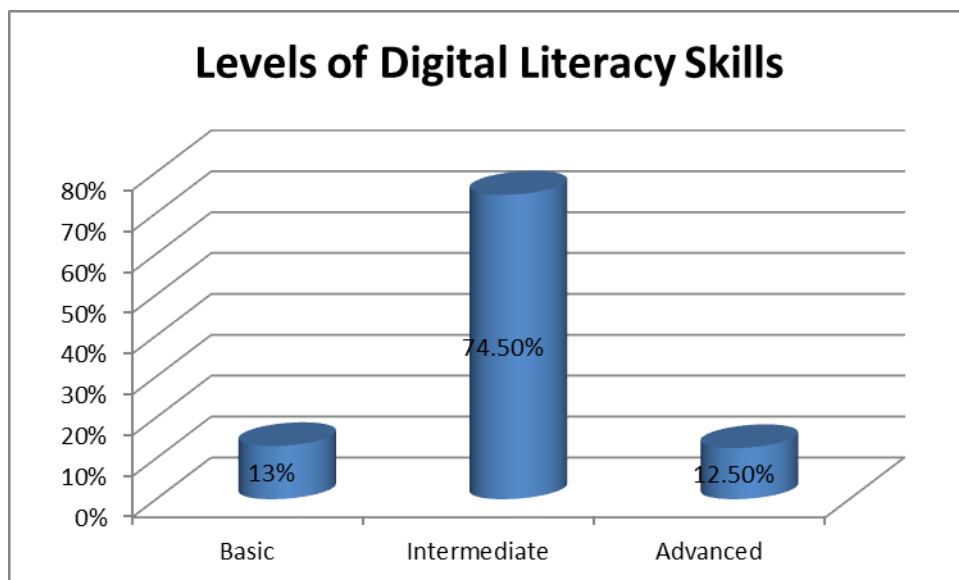


Figure 4.4: Level of Digital Literacy Skills on Access and Use of Electronic Resources by Postgraduate Students of Strathmore University (n=184)

Source: Field Data, 2018

The results in Figure 4.4 reveal that 24 (13%) of the respondents had basic digital literacy skills levels while 137 (74.5%) had intermediate digital literacy skills, and only 23 (12.5%) had an advanced level of digital literacy skills. Consequently, the study sought to establish from library staff the level of digital literacy skills they possess and how they used the skill for training users on how to access and use ICTs such as the internet, electronic resources, and weblogs, portals, Library Management Software among others.

The Systems Librarian [SL] had this to say:

I have advanced level of digital literacy skills (shaking the head) which enables me to access electronic resource databases and develop library website. I assist library users to access electronic

resources and upload research publications to online platforms like institutional repository.

According to the Reference Librarian [RL]

..... Aaaaah my level of digital literacy skills is average and therefore I can do tremendously well searching and retrieve online information for library users as well as train library users on searching, retrieving and using electronic resources on their assignment.

According to Senior Librarian Assistant [SLA], he pointed out:

My digital literacy skills are basic and therefore I can do basic searching and retrieval of online information for library users.

Based on the results, it is clear that postgraduate students and library staff have different levels of digital literacy skills resulting into unequal access to ICT facilities and the use of electronic resources while the library is equipped with ICTs facilities that require adequate digital literacy skills for their use for effective utilization of electronic resources.

4.4.2 Digital Literacy Skills Possessed by Postgraduate Students that Assist in Access and Use of Electronic Resources

The study sought to find out from the respondents the digital literacy skills they possess that are useful in accessing and using electronic resources in their day-to-day academic life. The parameters used to measure digital literacy skills on the sub-theme 4.4.2 was adopted from UNESCO (2018, p.6). This was necessary to ascertain the different digital literacy skills postgraduate students of Strathmore University acquired over time as they undertook their studies. The results were as follows:

Table 4.6: Digital Literacy Skills Possessed by Postgraduate Students (Multiple Responses)

Digital literacy skills possessed	Frequency	Percentage (%)
Skills for accessing electronic resources	181	98.4
Electronic search and retrieval skills	179	97.3
Locating and navigating the electronic resources database	173	94
Internet surfing skills	184	100
Skills for downloading and saving articles from electronic resource databases	169	91.8
Basic Computer operations skills	184	100
Communication skills (sending and receiving email)	184	100
Participating in social networks for the creation and sharing of knowledge	184	100
Using keyword phrases to search for information on the internet	156	84.8
Using more advanced searching techniques than keywords	159	86.4

Source: Field Data, 2018

From the table, 181 (98.4%) respondents believed that they had skills for accessing electronic resources while 179 (97.3%) confirmed that they were able to search and retrieve electronic resources. Further, 173 (94.0%) claimed they had skills in locating and navigating electronic resource databases, whereas 184 (100.0%) respondents indicated that they could surf the internet to access e-resources. A total of 169 (91.8%) respondents said they had skills for downloading articles from electronic resource databases subscribed by the library while 184 (100.0%) claimed that they had Internet surfing skills, basic computer operation skills, communication skills (sending and receiving email) and participating in social networks for the creation and sharing of knowledge. Besides, a good number of 156 (84.8%) postgraduate students had skills for using keyword phrases to search for information on the internet whereas 159(86.4%) had skills for using more advanced searching techniques for accessing, searching, retrieving, downloading and saving articles from electronic resource databases.

The study further sought to establish how the different levels of digital literacy skills improved their academic performance. This question aimed to examine how postgraduates' technology and digital literacy skills in accessing and using electronic resources assist them in their academic work, learning, and research activities. The results were as follows:

- Extended their access to a wide range of information as well as up-to-date electronic resources;
- Faster access to needed information;
- Improved access to various electronic resources databases;
- Ability to communicate online using email and social media;
- Able to use digital technology to access electronic resources;
- Able to download electronic resources, save, retrieve, and print;
- Have confidence in using computers and the internet to access and use electronic resources in research;
- Ability to use the internet and computers safely and securely and;
- Able to use Google Scholar and other databases for studies and research;

The results reveal a positive relationship between digital literacy skills possessed by postgraduate students on access and use of electronic resources in assisting them in their academic work, learning, and research activities.

All the key informants 5 (100%) collectively stated that their different level of digital literacy skills enable them to:

- Access electronic resource database searches;
- Do digitization;
- Send and receive e-mails;

- Uploading documents to online platforms like institutional repository'
- Using different social media;
- Apply digital library development skills;
- Applying new technologies into library services;
- Apply library website development skills;
- Use different storage devices to preserve digital contents;
- Access open-sources software;
- Create different file formats; and
- Retrieve information.

Based on the results, it is clear that postgraduate students and library staff possess various digital literacy skills which determine the extent they can use ICTs to access and use electronic resources.

4.4.3 Adequacy of Digital Literacy Skills in terms of Access and Use of Electronic Resources

The study sought to find out how the postgraduate students rated their adequacy of digital literacy skills on access and use of electronic resources. These would help measure the effectiveness of the digital literacy training program. Their responses are as indicated in figure 4.5 below.

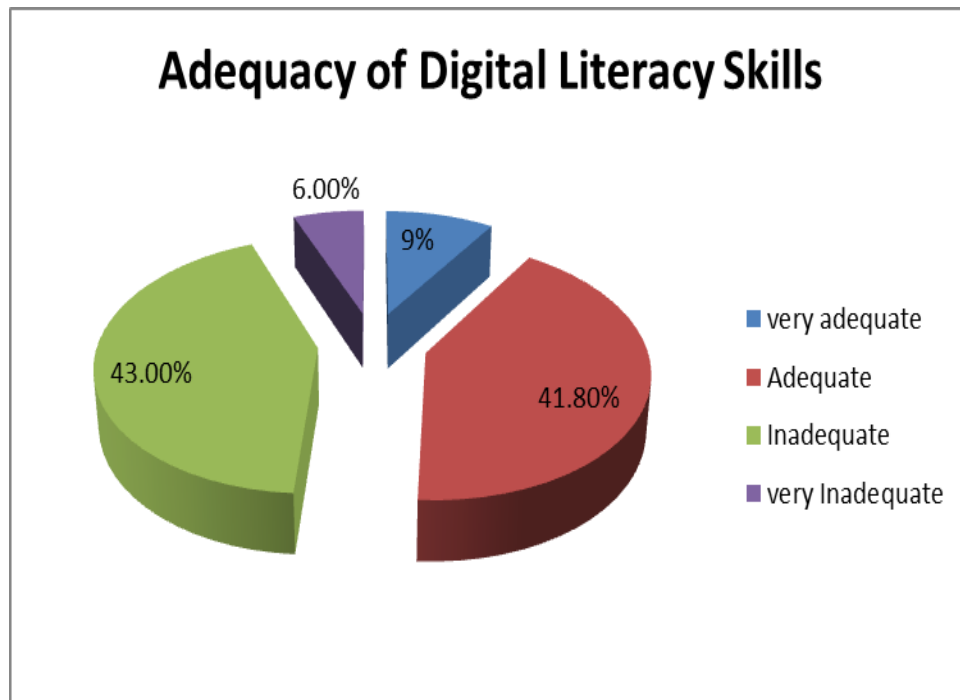


Figure 4.5: Adequacy of Digital Literacy Skills of Postgraduate Students on Access and Use of Electronic Resources (n=184).

Source: Field Data, 2018

The findings indicated that 17 (9.2%) of the respondents had very adequate digital literacy skills while 77 (41.8%) of the postgraduate students indicated their skills were adequate. Meanwhile, majority of respondents 79 (43%) felt that they had inadequate digital literacy skills whereas a fraction of respondents 11 (6%) felt that they had very inadequate digital literacy skills. Therefore, the study revealed that most of the respondents 79 (43%) felt that their digital literacy skills were inadequate and, therefore, limited utilization of electronic resources. Postgraduate students who indicated they had inadequate digital literacy skills were asked to indicate the difficulties they experienced when accessing electronic resources. The following are the challenges they said they faced:

- Limiting search results.
- Developing a search strategy.
- Using the software interface.

- Lack of general computer skills.

Therefore, the finding regarding digital literacy skills revealed a gap in postgraduate students' skills, which could influence or cause low utilization, ineffective and inefficient usage of electronic resources.

On adequacy of digital literacy skills of library staff to assist users to access and use electronic resources, Senior Library Assistant [SLA] cited:

Digital literacy skills of most Library staff were inadequate, thereby limiting their capacity to fully assist users to access and use electronic resources to satisfy their information needs.

University Librarian (UL) pointed out that:

Inadequacy of digital literacy skills of library staff especially the library assistants limits access and utilization of electronic resources implying that their ability to search, retrieve, and use ICTs and electronic resources may not be maximally utilized for scholarly and research work as they are supposed to be. This situation meant a dire need for adequate digital literacy and electronic resource training programmes to up skills, reskills and upskill library staff to assist library users improve on skills necessary to utilize online resources.

Based on the findings, it is clear that inadequacies in digital literacy skills rob postgraduate students' maximum benefits derivable from the emerging digital realities of their learning environment and for effective utilization of ICT and electronic resources in their academic responsibilities.

4.4.4 Effect of Digital Literacy Skills on Access and Use of Electronic Resources on Academic Performance

This was the most important aspect related to the effects of digital literacy skills on the access and use of electronic resources on the academic performance of postgraduates of Strathmore University. The question was framed in the following levels: very high, high, moderate, low, and very low scales. The responses are presented in Figure 4.6 below.

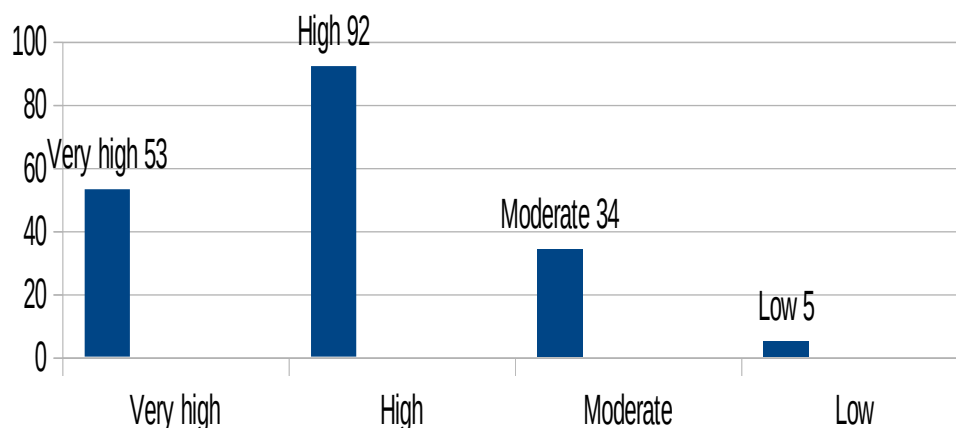


Figure 4.6: Effect of Digital Literacy Skills on Access and Use of Electronic Resources on Academic Performance (n=184)

Source: Field data, 2018

It is apparent from this Figure 4.6 that majority of the respondents, 145 (78.8%), agreed that digital literacy skills had highly assisted them in their academic performance whereas 34 (18.5%) believed that digital literacy skills had moderate influence on their academic performance. However, 5 (2.7%) of the respondents indicated that digital literacy skills did not influence their academic performance. In terms of digital literacy skills assisting and improving on academic performance, all the 5 (100%) key informants interviewed indicated that digital literacy skills positively assisted students and academic staff to access and use current and up to date online information that improves the quality of learning, teaching and research work.

4.5 Application of ICT and Digital Literacy Skills in Facilitating Adequate Access and Use of Electronic Resources

The application of ICTs in access and use of electronic resources holds the most significant promise in teaching, learning, and research by digitally literate and skilled students and teaching staff. Technology is becoming critical as a competitive tool that is being incorporated in library's digital strategy and offering libraries a new

world of opportunities to engage patrons on the best way for fast and unlimited access to vast global online information and knowledge resources resulting into many learning and research benefits.

4.5.1 Availability of ICTs Facilities to Postgraduate Students

The study sought to find out if postgraduate students and staff of Strathmore University have access to ICTs infrastructure devices. The purpose of this question was to establish whether the availability of Information and Communication Technologies (ICTs) facilities influence access and use of electronic resources. This was a multiple-response question, and responses are shown in Table 4.7 below.

Table 4.7: Availability of ICT facilities to postgraduate students (n=184) (Multiple Responses)

ICTs/Digital devices	Frequency	Percentage
Tablets	53	28.8
Smartphones	184	100
computers and laptops	184	100
Scanners	6	3.3
Projector	163	88.6
Internet connectivity	184	100
Others	0	0

Source (2018): Field data, 2018

The results show that all 184 (100.00%) respondents indicated they had access to smart phones, internet connectivity, computers, and laptops, followed by 163 (88.6%) who had access to projectors while 53 (28.8 %) respondents indicated tablets, and finally, access to scanners was only indicated by a small number of 6 (3.3%) of the respondents.

Further, the study sought to establish from the library staff the type of ICTs devices in place for staff and students to use in accessing and using electronic resources. The data was solicited through interviews with the University Librarian, Senior Librarian Assistant, and Systems Librarian to establish the type of ICTs the university library

had implemented and their sentiments were similar. University Librarian (UL) pointed out:

University library is fully automated on KOHA Integrated Library Management System; there are 14 computers allocated to staff at a ratio of 1:1, 50 computers for general library users, 1 computer lab with 30 computers, 5 computers for OPAC, 50 computers in Study Carrels, 5 computers in the group meeting room, computers in the Graduate Resource Centre; internet via fibre optic with good connectivity; wireless internet used with laptops; printers; library website that provides access to e-resources and other information; other information resources such as CD-ROMs, DVDs, and audio-visual materials.

System Librarian LSL] commented:

SUL is fully automated on KOHA Integrated Library Management System; there are computers for staff and students with internet connectivity that provides access to e-resources. However, there is the need to increase the number of networked computers and other ICT facilities to match the ever-increasing number of students in the University

Based on the results, it is clear that the students and staff of Strathmore University who are equipped with the necessary digital literacy skills could access ICTs facilities within the library to enable them use electronic resources that support and promote quality teaching and learning activities to satisfy their information needs.

4.5.2 Adequacy of the Available ICT Facilities in the Library

The study sought to determine the adequacy of the available ICT facilities in supporting the acquisition of digital literacy skills necessary for accessing and using electronic resources as shown in table 4.8.

Table 4.8: Adequacy of the available ICT facilities and electronic resources subscribed by library

Adequacy of ICT facilities	Frequency	Percentage (%)
Very adequate	7	4.8
Adequate	32	17.4
Inadequate	134	72.9
Very inadequate	11	6
Total	184	100

Source (2018): Field Data, 2018

The results revealed that 134(72.9%) of the respondents stated that the ICT facilities were inadequate, while 32(17.4%) felt that they were adequate, followed by 11(6.0%) who indicated that they were very inadequate, and finally 7(4.8%) of postgraduate students stated that the ICT facilities were very adequate.

Finding from the Deputy Librarian [DL], he clarified thus:

ICT facilities in Strathmore University Library were inadequate and not enough for usage by all library users considering the ever-increasing number of students being enrolled in the university who need to access and utilize electronic resources through the available ICT facilities at the library.

The System Librarian [SL] said:

Apart from inadequate ICT facilities, internet connectivity is unreliable and slowness of computers in downloading articles have always been an issue that most users cited as one of the discouraging factors in access and use of electronic resources. Furthermore, there is need to acquire modern computers and increase the number of networked computers and other ICT facilities to support the ever-increasing number of students in the University who demand for information services.

Based on the findings above, the study shows that Strathmore University Library has made significant investment to support teaching, learning, and research work through technology-based environment, subscription of electronic resources and digital literacy training. The increase in postgraduate students' admission without increase in the number of ICT facilities to provide access to electronic resources will remain a problem. Most likely, only a few postgraduate students would likely afford access to the needed ICT facilities without the University's library support and this would slow their research work and eventually set in frustrations

4.5.3 Use of ICTs to Facilitating Access and Use of Electronic Resources

The study sought to find out the use of ICTs by postgraduate students to facilitate access and use of electronic resources available in the library. The results are shown in table 4.9 below.

Table 4.9: Use of ICT to Facilitating Access and Use of Electronic Resources (Multiple Responses)

Use of ICT tools	Frequency	Percentage (%)
Enhanced online searching and discovery	176	95.7
Expanded Access to electronic resource	181	98.4
Browsing and sharing of information	169	91.8
Online communication	184	100
Online learning opportunities	184	100
Downloading and saving of online information	173	94.0
Remote access to library electronic resources	79	43.0

Source: Field Data, 2018

From table 4.9 above, it is evident that 176 (95.7%) of the postgraduate students agreed that they apply and use ICTs and digital literacy skills to carry out enhanced online searching and retrieval of information. Further, 181 (98.4%) of them believe that application of ICTs and digital literacy skills supports expanded access to electronic resources databases, while 169 (91.8%) of postgraduate students agreed of being able to browse and share information. However, 184 (100%) of the respondents apply use of ICTs and digital literacy skills on online communication and learning opportunities respectively.

In comparison, 173 (94.0%) of the respondents felt that they apply ICTs and digital literacy skills were to download and save online information a very small extent facilitates effective access and use of electronic resources. However, 79 (43.0%) of them apply and use ICTs and digital literacy skills to remotely access and use library electronic resources. All the key informants, 5 (100%), collectively stated that the use of ICTs and application of digital literacy skills supports and provides access to electronic resources to postgraduate students in writing articles, assignments, thesis writing and research work, online searching, retrieval, online communication and learning.

The Deputy University Librarian had this to say:

Strathmore University Library provides access to ICT facilities which increases and promotes utilization of a wide range of electronic resources and to a large extent support quality teaching, learning and research activities.

Based on the results, it is clear that with availability of ICT facilities in Strathmore University Library, postgraduate students who are digitally literate could find it easy to apply and utilize ICTs to search access and use electronic resources to satisfy their information needs.

4.5.4 Rating the Digital Literacy Skills upon the Use ICTs to Access and Use Electronic Resources

Digital literacy skills, the attitude of library users, and awareness of electronic resources are important factors determining the use and non-use of electronic resources. The respondents were asked to rate their ability to use ICT facilities to access and use electronic resources. The results are presented in figure 4.7.

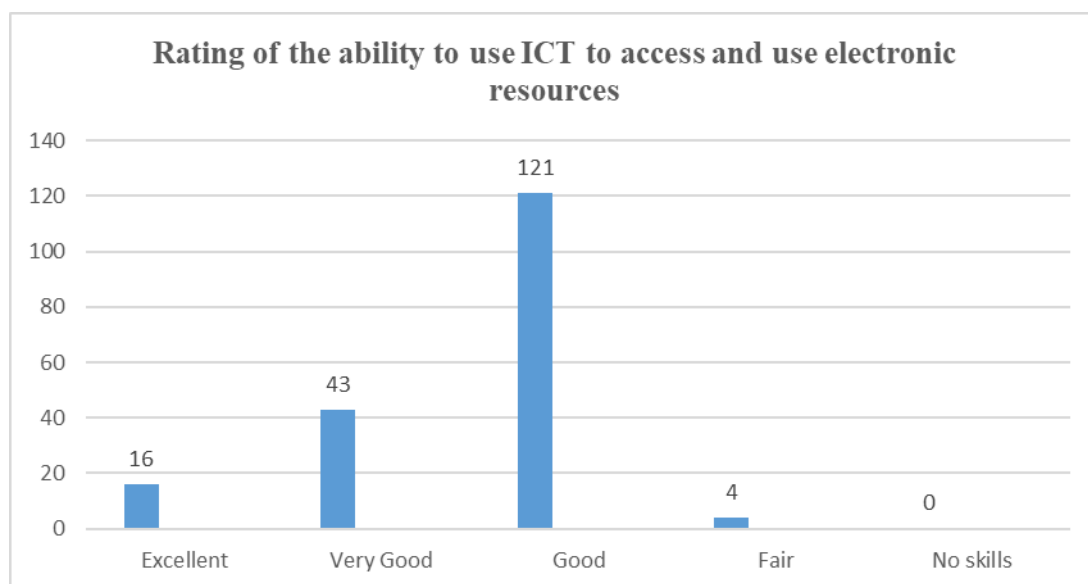


Figure 4.7: Rating the Digital Literacy Skills upon the Use ICTs to Access and Use Electronic Resources

Source: Field data, 2018

The findings indicate that 16 (9.0%) of the respondents were excellent at using computers to access electronic resources, while 43 (23.0%) were very good at using the computer. A more significant percentage of the respondents, 121 (66%), were good at using computers. However, it was also revealed that 4(2.0%) of the respondents indicated that they were fair in using computers, while none of them had no skills in using computers to access and utilize electronic resources. Furthermore, all the respondents who were interviewed agreed that they were good in using computers and other ICT facilities that support and enable access to electronic resources. This result implies that most of the respondents were good at using computers and therefore a need for re-skilling and up skilling for proper utilization of ICT tools to access and use electronic resources.

4.5.5 Availability of Electronic Resources in the Library that can be accessed through ICT Facilities

The study sorts out the types of electronic resources available in the library to be accessed by postgraduate students and the results are shown in table 4.10 below.

Table 4.10: Electronic resources available in the library (Multiple Responses)

Electronic Resources	Frequency	Percentage%
Electronic books	184	100
Electronic journals	184	100
Online databases	156	85
Digital repository (Institutional repository)	182	99
Online Public Access catalogue	184	100
Ask a Librarian	184	100
Remote Access (EZProxy)	140	76

Source: Field data, 2018

The results revealed that 184 (100%) of the respondents acknowledged that electronic books, electronic journals, online public access catalogue, and Ask a Librarian were available in the library. Remote Access (EZProxy) is available in the

library as confirmed by 140 (76%) respondents whereas 156(85%) respondents ascertained the availability of online databases. This confirms that most postgraduate students are frequent users of library electronic resources and understand that the resources are essential to their studies. The Reference Librarian [RL], in charge of reference and electronic resources section, strongly agreed and said:

Strathmore University Library has made a significant investment in subscribing to several electronic resource databases from different renowned publishers and for a variety of subjects that are in line with degree courses offered.

Also, the University Librarian [UL] highlighted that:

There is substantial budgetary allocation of over two million shillings every financial year for renewal of the subscription to electronic resources and a well-established information literacy program.

This implies that a tremendous amount of investment has been placed in acquiring and storing various kinds of electronic resources in Strathmore University Library due to their potential benefits and the availability and capability of latest technologies for facilitating their use to support teaching, learning and research work.

4.5.6 How Electronic Resources are Accessed by Postgraduate Students

Postgraduate students were asked to indicate how they accessed the university library's electronic resources from a list of options, and their responses are shown in table 4.11 below.

Table 4.11: Means of Accessing Electronic Resources by Postgraduate Students (Multiple Responses)

How e-resources are accessed by students	Frequency	Percentage
Physically visiting the library	184	100
Remotely from a commercial cyber café	101	54.9
Remotely from my home	103	60.0
Remotely from my place of comfort	171	93
Remotely from outside the library but within the university campus	98	53.3
Remotely from outside the library and outside the university campus	79	43

Source: Field data, 2018

Findings in Table 4.11 reveal that 184(100.0%) respondents from Strathmore University accessed library e-resources by physically visiting the library while 101(54.9%) respondents accessed library e-resources from a commercial cyber café. It is also observed that another 103 (60.0%) and 98 (53.3%) of respondents remotely accessed e-resources from their homes and their places of comfort respectively. Further, 98(53.3%) and 79(43.0 %) accessed remotely from outside the library but within the university campus and accessed electronic resources remotely from outside the library but outside the university campus correspondingly. The study found that most postgraduate students accessed library e-resources mainly by physically visiting the library, but least do so remotely from outside Campus.

Reference Librarian [RL] asserted that:

...Users have many options to access library electronic resources such as remote-access, on campus and outside the library and whether to physically visit the library or at their places of comfort.

Therefore, going forward there is a need to devise access points for the users for proper utilization of electronic resource.

4.5.7 Purpose for Using Electronic Resources

The purpose of using electronic resources differs from one user to another. The researcher sought to determine the purposes for which electronic resources are used by postgraduate students. Table 4.12 below summarizes the findings.

Table 4.12: Purpose for Using Electronic Resources (Multiple Responses)

Reasons	Respondents	Percentage
Completion of assignment and seminar presentation	86	46.7
Publishing research articles	17	9
Keeping up-to-date subject information	132	71.7
Research (project work/thesis)	179	97.3
Finding relevant information in the area of specialization	103	56

Source: Field Data, 2018

When asked to give reasons for using electronic resources, the majority of the respondents 179 (97.3%) and 132 (71.9%) used electronic resources to support their research and also to keep up-to-date with subject information respectively, while 103(56%) of the respondents stated that they used electronic resources to find relevant information in their area of specialization. However, 86 (46.7%) of the respondents used electronic resources to complete assignments and seminar presentations and a small percentage of 17(9%) respondents used electronic resources to publish articles.

The results obtained from interviews established that electronic resources are very useful for postgraduate students in teaching, learning, and research purposes.

The Reference Librarian [RL] said thus:

Library users mostly use electronic resources depending on the situation at hand, for example, to complete assignments, do research, find current and up to date information and publish articles to gather information on a specific topic, to gain general information, and to obtain answers to specific questions.

Such an observation reflects the fact that currently users are more dependent on the availability of electronic resources to meet their academic and research needs.

4.5.8 ICT Policy in Place to Promote Access and Use of Electronic Resources

To ascertain the availability of ICT policy and how it supports access and use of electronic resources, the respondents were asked to state whether Strathmore University had ICT that supports access and use of electronic resources. The study established that 172 (93.5%) postgraduate students agreed to existence of an ICT policy at Strathmore University while 12 (6.5%) were not sure of existence of an ICT policy that supports access and use of electronic resources.

It was necessary to seek the opinion of key informants who were interviewed that is the University Librarian, Deputy University Librarian and Senior Library Assistant.

All the respondents had the same responses by revealing that:

Strathmore University has a comprehensive ICT policy that guide on the use of ICTs in information access, sharing, and use within the University. Furthermore, there was absence or lack of an electronic resource policy.

The University Librarian made this observation:

Although there is a comprehensive University ICT policy, it is a general policy for the entire university that guides on the use of ICT infrastructure and as well as promoting digital literacy training for users and it does not narrow down specifically to access and use of electronic resources subscribed by the library since there was an absence of electronic resources policy.

A further probe on whether the University had electronic resource policy, all the key informants acknowledge that:

There is no electronic resources policy in place at the moment but they are in progress to develop an appropriate electronic resources policy that will go hand in hand with the available ICT policy to support access and use of electronic resources.

It was necessary to seek the opinion of the University Librarian (UL) who is the overall manager of the library on the issue of electronic resources policy and the response from UL was:

Strathmore University Library has no electronic resources policy but the library relies on the broad University ICT policy as well as the broad collection development policy as a guideline on how to access and use of electronic resources and further, I suggest that the Library ought to establish, implement and enforce electronic resources policy that is subject to constant review and further supports ICT policy on use and access of electronic resources. The library is in the process of formulating and developing an effective electronic resource policy.

Such an observation calls for the establishment and development of an electronic resource policy that will support ICTs policy which in turn will go a long way in facilitating access and use of electronic resources.

4.6 Digital Literacy Training Programmes for Postgraduate Students to Facilitating Access and Use of Electronic Resources

Digital literacy training programmes encourage, equip, and enable postgraduate students, lecturers and librarians to develop skills and knowledge necessary for searching, browsing, accessing and using electronic resources (Bartol et al., 2018).

4.6.1 Availability or Absence of Digital Literacy Training Programmes for Postgraduate Students to Access and Use Electronic Resources

The study endeavoured to establish whether Strathmore University had any digital literacy training programmes for postgraduate students to access and use electronic resources effectively and whether respondents were aware of it. A total of 181 (98.0%) of the respondents agreed that the library had digital literacy training programmes that enlightens them on how to access and use electronic resources. On the contrary, 3 (2.0%) disagreed with the library having any skills development

programme necessary for accessing and using electronic resources, as shown in figure 4.8 below.

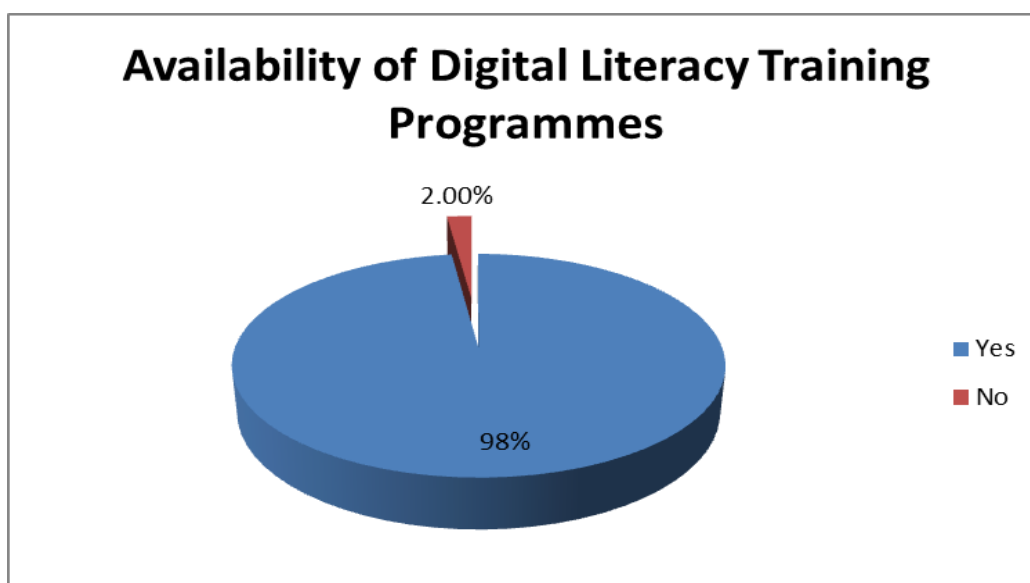


Figure 4.8: Availability or absences of digital literacy training programmes for postgraduate students to access and use electronic resources (n=184)
Source: Field Data, 2018

Most respondents indicated that the library had digital literacy training programmes to support access and use of electronic resources. According to the Reference Librarian who is in charge of the electronic resources section and information literacy/digital literacy training, [RL] he observed thus:

Digital and information literacy has been embedded with the communication skills units as a course taught in the university. Library users are introduced to the concepts of digital and information literacy, search skills on the various databases, locating information resources, and evaluating the information sources and using them effectively and ethically.

Similarly, the University Librarian [UL] stated:

Digital literacy training programmes are available at Strathmore University Library mainly through library tours, orientation sessions, introductory information literacy skills courses, online orientations, web-based tutorials, online users' instructions, online training, databases searching and teaching advanced information searching skills. Furthermore, digital literacy training is the only way to improve and boost skills and competence for access and utilization of electronic resources.

Thus, the general view of the above is that SUL had digital literacy programmes to support access and use of electronic resources and therefore a necessity for a good digital literacy training programmes to enhance postgraduate students and library staff to develop digital literacy skills for effective use of ICTs to access and utilize electronic resources.

The study further endeavoured to establish whether the respondents had received any training on using electronic resources.

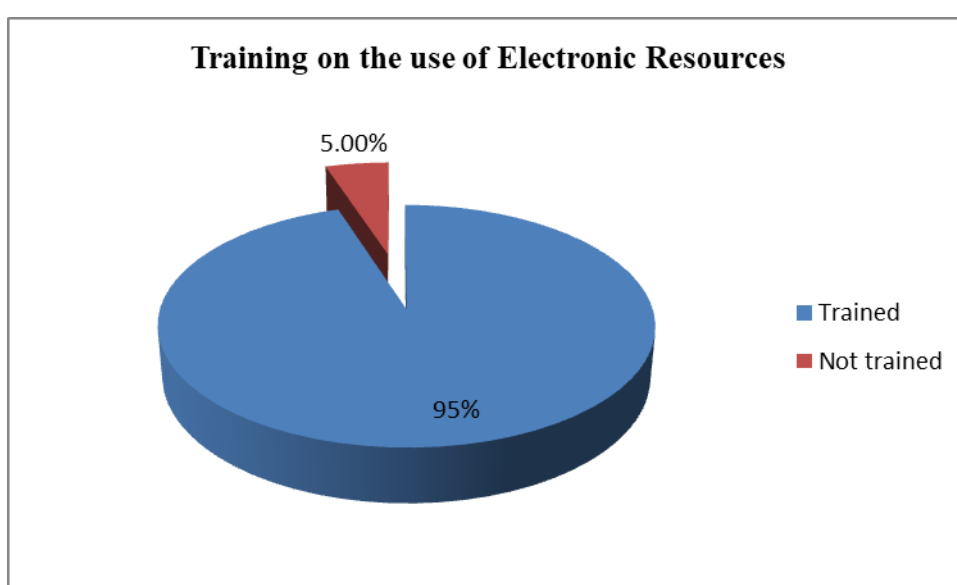


Figure 4.9: Training on the use of Electronic Resources (n=184)
Source: Field Data, 2018

A total of 175 (95%) of the respondents had received digital literacy training, while 9 (5%) had not received any training on using electronic resources. The majority of respondents indicated that they had digital literacy skills training in the use of electronic resources. In this light, the importance of digital literacy training cannot be overly emphasized. Once the postgraduate students are equipped with digital literacy skills through appropriate training, they will be knowledgeable in electronic resource searching, retrieval and use including using computers for other related academic works.

The key informants are generally in agreement that they had received training on access and use of electronic resources. As such, library staff must first receive digital literacy training before transferring any acquired knowledge and skills to postgraduate students of Strathmore University concerning how to search, retrieve, access, and use electronic resources.

The study further aimed to determine whether the postgraduate students do apply the knowledge and skills they acquire from digital literacy and electronic resource training program to access and use electronic resources as stated in the theoretical framework of (Ndubisi & Jantan, 2003) that Computer skills of a user will determine his/her usage of the information system. Correspondingly, a study done by Majd and Abazova (1999) revealed that limited skills or lack of electronic resources searching skills limits postgraduate students' use of e-journals. These questions aimed to determine the effectiveness of training offered by Strathmore University Library and whether they are up-to-date with the current dynamic information needs of users and the changing roles of the libraries. Thus, the postgraduate students were asked to indicate if they would apply the skills, they had acquired from the training program in searching for electronic resources, as shown in figure 4.10 below.

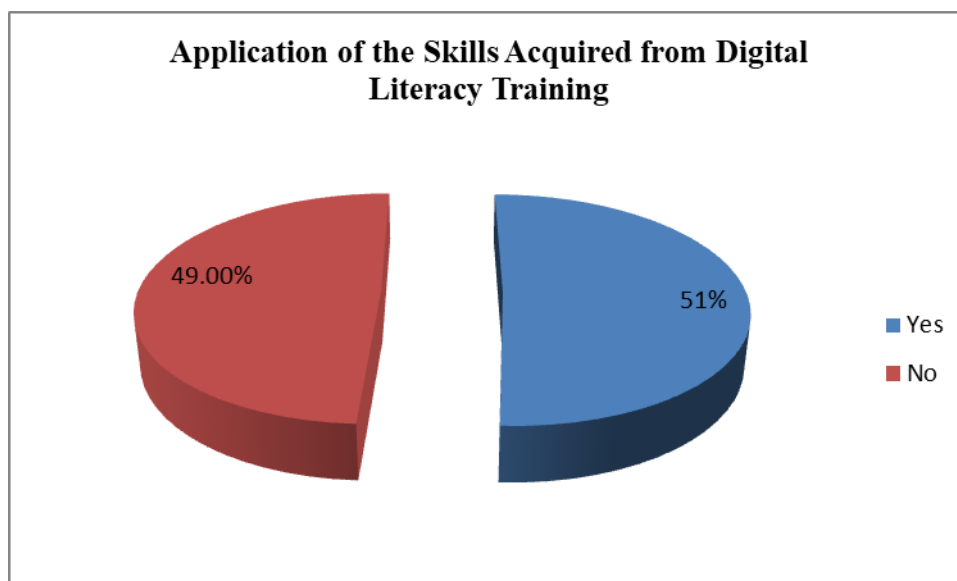


Figure 4.10: Application of the Skills Acquired from Digital Literacy and Electronic Training Program for Access and Use of Electronic Resources (n=184)

Source: Field data, 2018

Figure 4.10 shows that 91(49.46%) of postgraduate students indicated they could not apply the knowledge and skills they had acquired from digital literacy and electronic resource training programme for access and use of e-resources. This indicated that the training program might have not earned them enough knowledge or skills to apply in access and use of electronic resources, or they deliberately use the skills acquired elsewhere to access electronic information within the university collection. However, 93 (50.54 %) admitted that they had acquired knowledge and skills from digital literacy and electronic resource training programme for access and use of e-resources. The study revealed that the digital literacy training program benefited just over half of the postgraduate students who acquired the skills and knowledge necessary for accessing and using electronic resources. However, a good number of the postgraduate students still needed to be re-trained in order to equip them with adequate digital literacy skills necessary to utilize electronic resources effectively.

The Reference Librarian [RL] had this to say:

Although there are digital literacy training programmes, many library users cannot apply the knowledge they acquired from digital literacy training to access and use electronic resources as a result of inadequate digital literacy skill, low publicity, inadequate training, restriction of access and poor internet connections.

The Deputy University said:

Although the library has a training policy, it needs to be reviewed in such a manner that digital literacy training and user education programmes are done frequently so as to equip library users with appropriate skills such as information literacy, information retrieval, computer skills among others as a strategy to promote effective utilization of electronic resources.

4.6.2 Digital Literacy Training Needs of Postgraduate Students of Strathmore University

The use of ICT and other related resources involve special digital literacy skills that cannot be ignored. These skills can only be acquired through proper training and guidance. To effectively use the increasing rate of electronic resources, postgraduate students need to acquire and practice the digital literacy skills necessary to exploit them. Against this backdrop, the respondents were asked about areas emphasized by the digital literacy training program on access and use of e-resources in the library. Table 4.13 below presents the data that was gathered.

Table 4.13: Digital Literacy Training Needs of Postgraduate Students of Strathmore University (n=184) (Multiple Responses)

Training needs	Response (Yes)	Percentage (%)
E-books and Journals	184	100
Online databases	123	66.9
Institutional repository	103	60
Online Public Access Catalogue	177	96.2
Ask a Librarian	113	61.4
Remote Access	166	90.2
Online searching and retrieval	171	93
Basic computer operation	67	36.4
Navigation of electronic resource databases	176	95.7
Internet surfing	182	98

Source: Field Data, 2018

The results show that majority of respondents 184(100%), 182 (98.0%), 177 (96.2%), 176 (95.7%), 171 (93.0%) and 166 (90.2%) indicated they were trained on e-books and journals, internet surfing, Online Public Access Catalogue (OPAC), navigating electronic resources databases, online searching and retrieval, and remote access, respectively. Further, 123 (66.9%) respondents agreed that they received training on online databases while 103 (60.0%) of the respondents indicated they were trained in the institutional repository. In addition, 113 (61.4%) claimed to have received training on Ask a librarian, whereas 67 (36.4%) of the respondents had received training in basic computer operation.

The References Librarian [RL] in charge of electronic resource training said:

... Mmmmmmmh during digital literacy training programmes, most postgraduate students in Strathmore University Library are trained on online databases, OPAC, institutional repository, internet searching, electronic books and journals among others.

University Librarian (UL) pointed out that:

...ahh (shrugging the shoulder) students have inadequate digital literacy skills in using various library electronic resource databases and therefore training users on access to ICT tools and various online databases such as e-books, e-journals, and OPAC is essential and therefore inevitably necessary for effective use of electronic resource databases.

Based on the results, it is clear that there is a need to widen the scope of training on electronic resources to re-skill and up-skill the competence of users on how to access and utilize the various electronic resource databases available in the library. This implies that postgraduate students may not access and use the various electronic resources databases without adequate digital literacy skills.

4.6.3 Digital Literacy Training Setup

The researcher sought to establish from the respondents the kind of digital literacy training set up. Out of 184 postgraduate students, 146 (79.3 %) had received training in a classroom setting, while 22(12.0%) had received training in a one-on-one kind of training, 10 (3.3%) had received training in a computer-based setup, and finally, 6 (5.4%) of postgraduate students had received digital literacy training through ICT tutorials as shown in the table 4.14 below.

Table 4.14: Digital Literacy Training Setup (n=184)

Kind of digital literacy training setup	Respondents	Percentage(%)
Classroom	146	79.3
User Instruction and ICT tutorials	6	3.3
One-on-one kind training setup	22	12
Computer-based training	10	5.4
Total	175	100%

Sources Data Filed 2018

This indicates that most postgraduate students received digital literacy and electronic resources training from a classroom setup.

4.6.4 Adequacy of the Digital Literacy Training Program on the Use of Electronic Resources

The study sought to determine how the students rated the adequacy of information and digital literacy training program on using electronic resources. These would establish whether the postgraduate students benefited by going through the program

thus measuring the effectiveness of the information literacy and digital literacy training program. To gauge this, the respondents were asked to give their views on the training program offered by the library staff on the use of electronic resources as indicated in figure 4.11below.

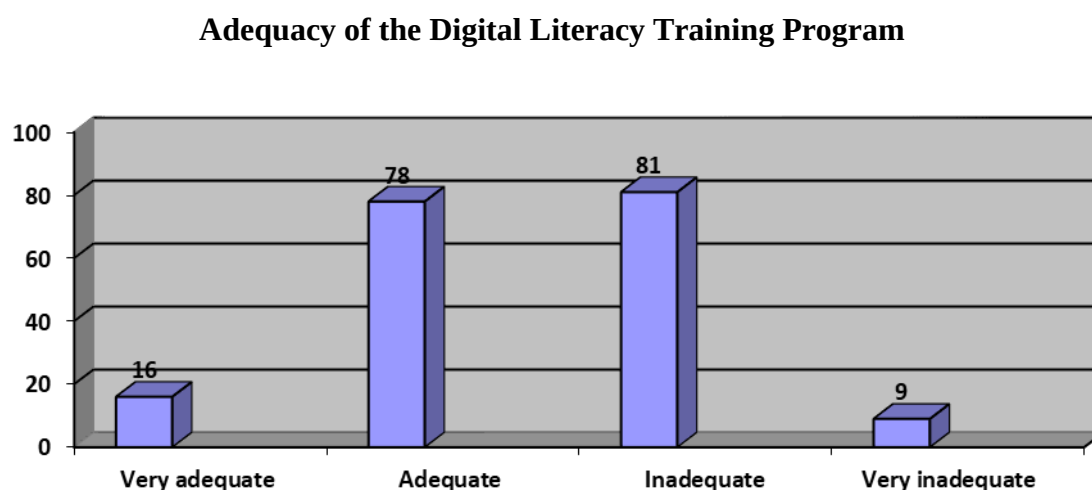


Figure 4.11: Adequacy of Digital Literacy Training Program Using Electronic Resources (n=184)
Source: Field Data, 2018

The results from figure 4.11 show that 90(48.9%) of respondents indicated that the training offered by library staff on the use of electronic resources was inadequate. Ninety-four (51.1%) of the respondents felt that the training offered by library staff on the use of electronic resources was adequate. All the key informants collectively stated that digital literacy training on access and use of electronic resources was inadequate. Therefore, the study revealed that majority of the respondents felt that the programs were inadequate therefore the postgraduate students were not able to acquire adequate digital literacy skills to help them utilize the electronic resources.

4.6.5 Training of Digital Literacy and Access and Use of Electronic Resources

The study sought to establish whether the postgraduates had received training. The question aimed to determine if librarians are involved in digital literacy and

electronic resources training necessary for accessing, using, and retrieving electronic resources. The feedback is shown in table 4.15.

Table 4.15: Training of Digital Literacy and Access and Use of Electronic Resources (n=184).

Trained by	Respondents	Percentage (%)
Library staff	168	91.3
Colleague or friend	9	4.9
self-study	7	3.8
Training institution	0	0
Total	184	100%

Source: Field Data, 2018

The study established that 168(91.3%) of postgraduate students received training from the library staff, 9 (4.9%) had received training from colleagues or friends, 7(3.8%) had received training from self-study and none of the postgraduates had received training from a training institution. The interviews concurred with the same sentiments that postgraduate students gave and therefore giving an indication that that the Librarian plays an essential role in training and facilitating access and use of electronic resources at Strathmore University. Based on the findings, it indicates that librarians have to seize the opportunity and embark on thorough digital literacy and electronic resources training which improves access and utilization of electronic resources.

4.7 Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library

The literature review for this study has brought to the fore that information users encounter several challenges in their bid to access electronic resources and also using ICT facilities in academic libraries. Unfortunately, these challenges may serve as destructive forces to deny postgraduates of Strathmore University the chance to

access and use electronic resources effectively. This study sought to establish the difficulties postgraduate students faced in their quest to access and use the electronic resources of the SU Library. Respondents were allowed to select more than one response. The table 4.16 below shows the responses received from the respondents.

Table 4.16: Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library (n=184) (Multiple Responses).

Response	Frequency	Percent (%)
Insufficient digital literacy skills	117	64
Insufficient electronic resources search skills	109	59.2
Poor internet connectivity	138	75
Insufficient digital literacy and electronic resources training	124	67.4
Information overload	47	25.5
Limited subscribed title from electronic resources databases	114	62
Power outages	133	72.3
Minimal exposure to technology	66	35.9
Inadequate technological infrastructure to support access and use of electronic resources	87	47.3

Source: Field data, 2018

From the table, the results suggest that majority of respondents 138 (75%), 133 (72.3%) and 124 (59.2%) cited poor internet connectivity, power outages and insufficient digital literacy and electronic resources training being the major challenge postgraduate students faced in accessing and using e-resources respectively. Further, 117 (64%), 114 (62%) and 109 (59.2%) of respondents indicated that insufficient digital literacy skills, limited subscribed title from electronic resources databases and insufficient electronic resources search skills were also cited as impediments postgraduate students faced in accessing and using e-resources correspondingly. Inadequate technological infrastructure to support access and use of electronic resources 87 (47.3%), minimal exposure to technology 66

(35.9%) and information overload 47 (25.5%) were part of the challenges that postgraduate students cited to inhibit access and use of e-resources.

On the other hand, library staff experiences various challenges as they try to provide electronic resources. They felt overwhelmed by the high number of students who demanded electronic resource services. The key informants pointed out that users did not understand how to search and use e-resources while others were ignorant on how to access and use electronic resources and inadequate digital literacy skills.

The University Librarian claimed that the library as a department faces several challenges in trying to train library staff to impart digital literacy skills and creation of awareness on access to and use of electronic resources.

The University Librarian [UL] cited the following challenges:

Lack or minimal funds allocated to support library professionals in training on Information/ICT/digital literacy skills/electronic resources training.

Non-attendance of training workshops on ICT and electronic resources training.

Shortage of skilled system librarian at the University at the moment who can train both on digital literacy training and use of electronic resources.

Unreliable internet connectivity a time when several users are trying to access and use electronic resources subscribed by the library.

The Reference Librarian [RL] had this to say:

In ensuring efficient e-resource provision to our clients, high-speed internet is necessary; slow and unreliable internet has become one of the biggest hindrances to information access and use; downloading online articles and books becomes a big challenge to us. Access to high impact journal articles from reputable databases is also one of the biggest challenges due to the high cost of subscription.

Therefore, high subscription cost was the foremost impediment to the use of electronic resources in many Kenyan academic libraries as reported by most library staff.

4.8 Measures to Improve Digital Literacy Skills to facilitate Access and Use of Electronic Resources

The last objective of the study was to establish the possible solution to challenges faced by postgraduates in using digital technology to access and use electronic resources. Respondents gave the following as possible solutions.

4.8.1 Appropriate Digital Literacy Training and programmes for Library Users

Respondents stated that librarians must develop a digital literacy training policy for users to guide and set appropriate programmes to facilitate the proper utilization of e-resources. They felt that if users were to make good use of electronic resources, they need to be adequately trained. On the other hand, library staff believed that user training on using electronic resources should be mandatory for all students and academic staff joining SU. Library staff suggested that they should be trained on digital literacy skills and competencies to empower them to train library users on how to access and use electronic resources. Furthermore, Strathmore University Library should develop and adopt digital literacy programs and standards to train students and academic staff on the role of technology, digital literacy skills and accessing and using electronic resources as well as working in an online environment.

The University Librarian [UL] stated:

Information/digital literacy and electronic resources training should be carried out throughout the year, especially one-on-one and group training.

This shows that postgraduate students and staff must be properly trained to improve their digital literacy skills and competencies to use ICTs to effectively access and utilize electronic resources.

4.8.2 Creating Awareness and Advocacy Programmes

Postgraduate students stated that the library should aggressively market electronic resources available to create awareness of the availability of electronic resources. The library needs to alert users on a new database available, and librarians should increase electronic resources awareness levels on using electronic resources databases and ways of navigating online tools.

4.8.3 Improve Computer Speed and Internet Connectivity

The slowness of computers in downloading articles was an issue that most respondents cited as a discouraging factor in using electronic resources. They wished they were allocated a new modern computer that would solve the technical problems they were facing. On the other hand, librarians felt that adding more dedicated bandwidth for the library would increase article downloads tremendously.

4.8.4 Subscription for Electronic Resources with Restricted Access and Addition of More Relevant Electronic Resources Database

Librarians were of the opinion that embargo problems could only be resolved by the University subscribing to the journal title in question separately from the INASP consortium. They also asked if the consortium member libraries could collectively come together and negotiate so that some publishers could lift the embargo at an additional cost.

Other respondents felt that there was a need to aggressively sensitize students on the availability of electronic resources. Other areas cited for improvement include:

- There should be an adequate power supply to facilitate uninterrupted services in the library.
- The library, through university management, should acquire power backup like a generator to support accessibility of library operation in case of power outages.
- Most postgraduates suggested that digital literacy programs should be included in the curriculum at Strathmore University, especially for undergraduates, postgraduate students and academic staff so they can be trained on digital literacy skills needed for accessing electronic resources.
- Respondents further stated that Librarians have to come up with an appropriate and effective policy for training on electronic resources access and use. They felt that for there to be good use of electronic resources, users need to be adequately trained.

All the key informants 5 (100%) suggested that the library needs to subscribe to more titles from electronic resource databases and work with the university to solve the embargo problem so that some publisher can lift it at an additional cost. Further, the informants suggested that they should be trained in digital literacy skills and competencies to empower them to train library users on accessing and using electronic resources. The further noted that, Strathmore University Library should develop and adopt digital literacy programs and standards to train students and academic staff on the role of technology and digital literacy skills in access and use of electronic resources as well as working in an online environment. In addition, the university needs to develop partnership and collaboration with government and ICT companies that provide infrastructure for teaching digital literacy in institutions of higher learning. Finally, the majority of library staff suggested that there should be

adequate funds for digital literacy programs and procurement of infrastructure to enable librarians and students to practice the acquired skills necessary for working and accessing electronic resources in an online environment. Finally, all informants suggested that the library needs to develop an effective and efficient electronic resource policy to support access and use of electronic resources.

4.9 Chapter Summary

This chapter has presented, analyzed, and interpreted the research findings. It is apparent from the research findings that postgraduate students have different levels of digital literacy skills that are needed to access and use electronic resources. The study concludes that digital literacy skills of postgraduate students of Strathmore University is inadequate and limits utilization of electronic resources. The study established that ICT facilities in Strathmore University Library were inadequate and not enough for usage by all library users as indicated by postgraduate students. It was revealed that even though electronic resources were utilized, the exploitation was not maximized, with electronic resources being used for multiple reasons. Despite digital literacy training programmes being in place, postgraduate students and library staff still did not have sufficient levels of digital literacy skills among others. The study revealed that a majority of the respondents felt that the digital literacy programs were inadequate and therefore suggested that the training offered by the library staff on the use of electronic resources was inadequate. From the findings, users faced several difficulties while accessing electronic resources. Recommendations were provided to help in mitigating the problems raised.

CHAPTER FIVE

DISCUSSION AND INTERPRETATION OF FINDINGS

5.1 Introduction

This chapter interprets and discusses the findings obtained from the data presented and analyzed in Chapter Four. This was done by focusing on the research questions and then relating to relevant literature in the area of study. Ng'eno (2018) believes that interpretation and discussion of findings are an important part of the study as it describes the relevance of results concerning the research question under investigation.

The study sought to investigate the application of digital literacy skills on access and use of electronic resources by postgraduate students of Strathmore University with the view to proposing measures to improve digital literacy skills on access and use of electronic resources. It is necessary to interpret and discuss the findings of the study to ensure that the research questions of this study are adequately addressed. The linking of the research questions and the findings from the study provides a meaningful explanation of the research problem, thereby arriving at the study's conclusion. The respondents comprised postgraduate students who use the SUL and some of the key informants from the University Library.

5.2 Background Information of the Respondents

This information was collected on postgraduate students and the library staff of Strathmore University on matters gender, age, year of study, length of usage of the library, the position of the key informant, working experience of library staff, and highest academic qualification of library staff. The findings revealed that 98 (53.3%) of the postgraduate students were male while the rest were female. No transgender sex was reported. These results show that almost an equal number of both male and

female postgraduate students participated in this study. It was also noted that 84 (45.7%) of the postgraduates were aged 26-30, while 40 (21.7%) were above 36 years old. Another 43 (23.4%) were 31-35 years, and finally 17(9.2%) of the respondents were between the age of 20-25. This implies that the majority of the respondents was young and fall between 26-30 years.

It was further noted that 181 (98.4%) of the respondents were master's students, whereas 3(1.6%) were undertaking a Ph.D. program. The findings suggest that most respondents were at the time of research undertaking their master's program. The results also revealed that a majority of respondents, 97(52.7%) were in their first year of study, while 65(35.3%) in their second year and finally, 22(12%) in their third year of study. On whether the postgraduate students were full time or part time learners, there was a near balance at 93 (50.5%) students being full-timers while 91 (49.5%) respondents were part-timers.

On the duration of library usage, the findings of the study revealed that 108 (58.7%) of the respondents indicated that they had used the library for one year, 58 (31.5%) of the respondents had been using it for two years, while 12 (6.5%) of the respondents had been using it for three years, and finally, 6(3.3%) of the postgraduates had used the library for four years, or more years. The findings suggest that most postgraduates had used the library for not more than three years. This could be because they started using the library by the time they were admitted to Postgraduates programmes.

The study further sought to find out the existing staff within the library, and it was established that the library had a University Librarian, Deputy University Librarian, System Librarian, Reference Librarian and Senior Library Assistant. Another

interesting finding is the duration of employment at Strathmore University Library. The results revealed that 1 (17%) of the respondents had been employed for less than one year while 4(83%) of the respondents had been employed for more than 4 years, indicating that the library is rich in terms of experienced and qualified staff. Finally, the finding of the study revealed that the majority of the library staff 3(60%) held master's qualifications, whereas the remaining 2(40) % of respondents were split with 1(20%) respondent holding a doctorate and the same percentage holding postgraduate diploma and none of them had diploma or certificate. The findings suggest that Strathmore University recruited qualified library staff with a good number of master's degree qualifications.

5.3 Level of Digital Literacy Skills of Postgraduate Students

Digital literacy skills are necessary for accessing and using electronic resources in institutions of higher learning and ease the difficulties associated with the usage of electronic resources. Such skills are handy for postgraduate students, lecturers and the library staff in searching, navigating, evaluating, and processing information using a wide range of information technology (Subaveerapandiyan et al., 2022).

The study's findings revealed that respondents had different levels of digital literacy skills resulting in unequal access to and use of electronic resources. This was supported by 24 (13%) of the postgraduate students who agreed that their level of digital literacy skills was basic, while 137 (74.5%) rated their level of digital literacy skills as being intermediate and 23 (12.5%) agreed to have an advanced level of digital literacy skills.

Findings from interviews revealed that the System librarian had advanced digital literacy skills. At the same time, University Librarian, Deputy University Librarian

and Reference Librarian stated of having moderate and the Senior Library Assistant agreed to have a basic level of digital literacy skills. This shows that the majority of library staff had moderate digital literacy skills. The findings of the study correlate with Baro et al. (2019), who assessed African English-speaking countries' university librarians' digital literacy skills and reported that most of them have moderate digital literacy skills.

A possible explanation for these results is that postgraduate students and library staff have different levels of digital literacy skills. This may imply that their ability to use ICTS to search, retrieve and use electronic resources may not be utilized as expected and supposed to be. This calls for postgraduate students and staff to be appropriately trained to improve their digital literacy skills and competencies to use ICTs to access and utilize electronic resources effectively.

The findings seem to concur with a study done by Somers (2015) on the Use of Electronic Resources by Postgraduate Students and Academics at the Graduate School of Business and Leadership, University of KwaZulu-Natal, that found the majority of postgraduate students and staff rated their levels of skills as intermediate resulting in inadequate and unequal utilization of electronic resources. Notably, Esfahani and Vahidi (2012) corroborate with the findings of Somers (2015) which reveals that the level of postgraduate students' digital literacy skills determines their access and utilization of electronic resources in pursuing academic success by effectively searching, accessing, and retrieving information for assignments, research, and other daily academic routines.

Even though the theoretical framework underpinning the study that is the Horizontal Pyramid Model advanced by Ndubisi and Jantan (2003) based on the Technology

Acceptance Model advocate for computing skills as a requirement in accessing and using electronic resources, having intermediate digital literacy skills is no guarantee that postgraduate students and the staff will optimally make use of electronic resources. At the same time, postgraduate students who had adequate digital literacy skills were still found to require training in online information search.

5.3.1 Digital Literacy Skills Possessed by Postgraduate Students and Library Staff that Assist in Access and Use of Electronic Resources

The findings revealed that different digital literacy skills possessed by postgraduate students included: skills and knowledge on how to use computers and Internet search for accessing, downloading and using electronic resources; online information searching; sending and receiving email; database navigation; social networking, connecting to the Internet; downloading files from databases; repairing hardware and installing software application and using search engines such as Google scholar. The findings are similar to those of Adeleke and Emeahara (2016) in their study on the Availability, Use and Constraints on the Use of Electronic Resources by Postgraduates Students at the University of Ibadan that found that the level of digital literacy skills possessed by postgraduate students will enhance their quest to retrieve information from the Internet, online databases, e-books, and e-journals, to solve the broadest range of tasks associated with the use of electronic resources for academic work. The findings from interviews further revealed that differences in the level of digital literacy skills of library staff enabled them to do; electronic resources database searches, online communication, upload documents to institutional repositories, use different social media, use KOHA (Library Management Systems), develop library website, installation of open-sources library software's and information retrieval technique.

In synchronizing the quantitative and qualitative data gathered on the theme, then the reference is made to a study done by Abrosimova (2020) to determine the level of digital literacy skills of students and staff at Kazan Federal University, Russia which revealed that most respondents admitted to having high digital literacy skills that are mostly sufficient for e-navigation though they indicated difficulties that they often resolve. On the contrary, Christy and Yusuf (2021) on their study on assessment of digital literacy skills of 100 academic librarians in Nigerian Universities using a qualitative approach, revealed a low-level digital literacy skill possession by most respondents hence such results increase curiosity and questions about the digital literacy skills level of postgraduate students as librarians are supposed to be digital literacy advocates to postgraduate students in their quest to use electronic resources.

In addition, Hamad et al. (2021) in his study support the findings of Christy and Yusuf (2021) by revealing that academic library professions were not very vast in advanced digital literacy skills such as coding, library website development, cloud computing, big data and database designs. Hamad et al. (2021) further recommended that librarians and students scale up their digital literacy skills to effectively function in the information age to access and utilize electronic resources. It is, therefore imperative to up-skills and reskill Strathmore library staff to have the necessary digital literacy skills to support postgraduate students accessing and using electronic resources.

Concerning the effects of digital literacy skills on the academic performance of postgraduate students, the study established that postgraduate students with good levels of digital literacy skills were able to achieve the following: access to a wide range of information; access to up-date-date electronic resources; ability to use email and social media; download, save, retrieve, and print; have confidence in using

computers, use Google scholar and other databases for studies and research among others for studies and research. These findings were in line with the finding of a study done by Abbas et al., (2019) on digital literacy effect on the academic performance of students at higher education level in Pakistan established that computer accessibility and digital literacy positively affected students' academic performance and use their digital literacy skills for internet browsing, printing documents, downloading electronic resources for academic works, sending of assignments and term-papers online for assessment by lecturers, social networking, online communication, scanning of documents, installing and updating software applications in a computer system.

In sum, it can be concluded that the importance of these digital literacy skills to postgraduate students is enormous in improving the overall performance of their academic work, meeting their information needs, and research activities among others. Thus, Strathmore University library should ensure that all students and academic staff undertake digital literacy training to explore and improve the usage of electronic resources.

In the same vein, this finding supports the Horizontal Pyramid Model by Ndubisi and Jantan (2003) based on the Technology Acceptance Model by Davis (1989) that the perceived usefulness of a system is a construct tied to an assessment of the benefits that accrue to an individual by using the technology. In this regard, the model suggests that with Strathmore University library acquiring ICTs and subscriptions to electronic resources databases, postgraduate students who possess digital literacy skills will use and benefit from electronic resources and progress in their research and academic-related activities.

5.3.2 Adequacy of Digital Literacy Skills on Access and Use of Electronic Resources

The era of digital technology demands the acquisition of digital literacy skills by students and academic staff necessary for accessing and using electronic resources. The study established that digital literacy training programmes were vital to postgraduate students in helping them acquire the digital literacy skills necessary for adequate access and use of electronic resources.

In this respect, the study revealed that most of the postgraduate students 79(43.0%), felt that their digital literacy skills were inadequate and therefore limit their access to and utilization of electronic resources. This may imply that their ability to search, retrieve and use electronic resources may be less utilized for scholarly and research work thus diminishing the potential, benefits and opportunities offered by electronic resources to postgraduate students.

Library staff interviews echoed the sentiments that postgraduate students must acquire adequate digital literacy skills to access and use electronic resources. This situation meant a dire need for adequate digital literacy and electronic resources training programs, user education and advocacy to improve literacy skills that facilitate access to and use of electronic resources.

These findings support the views of Adeleke and Emeahara (2016) in their study titled *Relationship Between User Education, Computer Literacy and Information and Communication Technology Accessibility and Use of Electronic Resources by Postgraduate Students in Nigerian Universities' Libraries'* that reveal that postgraduate students with adequate digital literacy skills may use the library environment with computers, ICTs and electronic resources at ease, while those with

inadequate digital literacy skills may find it challenging to utilize electronic resources.

In tandem with the provision of the Model of Students' Digital Literacies (Beetham & Sharpe, 2011) that underpins the study, at the practice level, postgraduate students who have acquired adequate digital literacy skills can make informed choices on how best to utilize ICTs to enhance their learning process through searching, accessing, and retrieving information from e-resources for teaching, research and learning activities thereby having their academic performance being rated high. Furthermore, the model implies that access and utilization of electronic resources require postgraduate students to acquire adequate digital literacy skills.

Of the 11(6.0%) postgraduate students who had very inadequate digital literacy skills to access and use electronic resources, the study revealed that the absence of general computer skills, difficulties using software interface as well as difficulty in developing a search strategy were part of the challenges they were facing in their quest to use ICTs to access electronic resources. Such challenges have robbed most university students at all levels of academia the great opportunities to utilize digital literacy skills in accessing and using electronic resources.

These findings concur with Tsakonas and Papatheodorou (2006)) study on analyzing and evaluating the usefulness and usability of electronic resources which established that postgraduate students might only access and use electronic resources with adequate digital literacy skills. On the other hand, Li and Yu (2022) say that lecturers must have adequate digital literacy to teach students online, which is required in the current educational model to access and use electronic resources for quality teaching and learning.

5.4 Application of ICT and Digital Literacy Skills in Facilitating Adequate Access and Use of Electronic Resources

University libraries provide access to information for students and academic staff through the provision of ICTs, internet connectivity, and subscriptions to electronic resources dependent on their possession of digital literacy skills.

5.4.1 Availability of ICTs Facilities to Postgraduate Students

Concerning the availability of ICTs by postgraduate students to access and use electronic resources at SUL, the study revealed that ICTs facilities and equipment majorly accessed by postgraduate students were smart phones, internet connectivity, laptops, tablets, projectors, printers, scanners, and computers among others (see Table 4.7). Sulemani and Katsepor (2007) observed that with the increase in access to computers, internet connectivity, and subscription to electronic resources in academic libraries, access to information has vastly increased but is dependent on the acquisition of digital literacy skills of users. With effective use of ICTs to access and utilize electronic resources subscribed by the library, digital literacy skills must be acquired by users to meet their information needs in good time and also remotely (Subaveerapandiyan et al., 2022).

From the study, smartphones and internet connectivity was the most commonly accessed digital device by postgraduate students of Strathmore University. The Model of Student's Digital Literacy by Beetham and Sharpe (2011) supports that at the access level postgraduate students need to gain access to ICTs, internet connectivity and use electronic resources to supplement their learning and research. In addition, postgraduate students need to own or access digital devices, hardware, software, internet connectivity, access to web-based tools, and online resources.

The findings from the interview further revealed that SUL is fully automated on KOHA Integrated Library Management System, having computers allocated to staff and students. SUL had computers allocated to various activities such as OPAC, labs, study carrels, Graduate Resource Centre and Internet via fiber optic with good connectivity and wireless internet connectivity with laptops, printers and a library website that provides access to e-resources. These results may be explained by the fact that there is accessibility and availability of good ICT infrastructure at Strathmore University library that can support postgraduate students with the necessary digital literacy skills to explore and make good use of electronic resources. This is an indication that the information technology infrastructure at SUL is well taken care of.

These findings support the Student's Digital Literacies Model by Beetham and Sharpes (2011), which emphasizes that students need to access institutional ICTs, internet connectivity, and electronic resources and have higher expectations for institutions to provide them with the access they need that will add value to their scholarly research work. This can be interpreted that access to ICTs, computer facilities, internet connectivity and proper digital literacy training in SUL is likely a significant drive to properly utilize electronic resources among postgraduate students and academic staff.

5.4.2 Adequacy of the Available ICT Facilities in the Library

The adequacy of ICTs facilities used to access and use electronic resources was another issue of concern in this study. The study found that most respondents stated that ICT facilities were inadequate, resulting in unequal access and limited access to and utilization of electronic resources. These findings are in tandem with the findings from the interviews with the University Librarian and Systems Librarian, pointing

out that ICT facilities in Strathmore University Library were inadequate and not enough for usage by all the users considering the growing population of students every academic year. The findings of the study by Blakes (2006) on the availability of ICT facilities in Kenya University Libraries reveal that ICTs facilities are not adequate in number for effective digital library operation and further asserted that there insufficient number and unavailability of some ICT facilities, such as the Internet, teleconferencing, digital scanners, and online information sources are the main problem and hindrances facing the use of digital literacy skills in Universities libraries and Colleges in Kenya.

5.4.3 Use of ICTs to Facilitating Access and Use of Electronic Resources

The results on the use of ICT tools and digital literacy skills in facilitating access and use of electronic resources revealed that the majority of postgraduate students and all library staff interviewed agreed to the fact that application of ICTs and digital literacy skills supported that expanded access to electronic resources databases, enhanced online searching, retrieval and discovery of information, online communication and learning opportunities, remote access to electronic resources, downloading and saving of online information by postgraduate students and would assist them in carrying out their academic task with ease.

This is in agreement with the assertions by Omosekejimi et al., (2018) in a study titled “ICT and Digital Literacy Skills: A Mechanism for Efficient Teaching in Nigerian Colleges of Education” that revealed that the majority of the respondents agreed to the fact that the use of ICT and application of digital literacy skills in teaching and learning has been reported to a very large extent facilitates adequate access to use of electronic resources to students at an institution of higher learning and resulted in many learning benefits.

5.4.4 Rating the Digital Literacy Skills upon the Use ICTs to Access and Use Electronic Resources

The findings established that most postgraduate students rated their ability and skills as good in using computer to access and use electronic resources, as shown in figure 4:7 in Chapter Four. Nevertheless, a smaller percentage, 4(2.0%) of postgraduate students, rated their level of digital literacy skills as not fair and felt that there was a gap in their digital literacy skills. This implies that they were not experienced enough in using computers except for performing basic computer tasks and simple ICT operations, resulting in unequal access and usage of electronic resources. Further, the results established that 121(66.0%) postgraduate students were good at using computers and ICTs to access and use electronic resources. These findings establish that there is an urgent need for SUL to organize digital literacy training to upskill and reskill postgraduate students and staff to improve their knowledge of the use of computers and ICTs tools to enhance and improve the usage of electronic resources.

The finding of this study concurs with the study done by Mugeru (2019) on the Effectiveness of Information Communication Technology Literacy Skills in the Utilization of Electronic Resources by Undergraduate Students at Karatina University. Mugeru found that the majority of undergraduate students believed that their ICT literacy skills was good and this helped them access, retrieve and make maximum use of electronic resources as required considering the significant investment made by the University in subscribing electronic resources. This meant that postgraduate students had confidence in using ICTs facilities coupled with the application of digital literacy skills acquired to use electronic resources subscribed to by the University Library.

The findings from interviews of informants revealed that most library staff were good and confident in using computers to access and use online resources. However, a small number of them still needed assistance and training to improve their knowledge and level of digital literacy skills to access and use electronic resources. A possible explanation of these results could indicate that more reskilling programme should be available for postgraduate students and the library staff to enable maximum utilization of electronic resources. On the other hand, library staff needed to have the training and experience in using computers and ICTs to access and use electronic resources to assist and train other library users on how best to utilize computers and ICTs to exploit the available electronic resources.

The current findings support Moghadami et al (2021) findings in their study on the Evaluation of Digital Literacy and Knowledge Competencies of Academic Librarians and Users which found that library staff and users should be equipped with various skills such as online information searching, resource sharing processes, social networking, instant messaging, blogging, and other digital skills activities related to university library services to enable them to maximize information resources available in electronic resources. In tandem with the provision of the Model of Student's Digital Literacy by Beetham and Sharpe (2011) postgraduate students who possess digital literacy skills and are exposed to computers, ICTs and electronic resources will gain adequate experience over time as they use ICTs to search, download, and access and use electronic resources to meet their information needs.

5.4.5 Availability of Electronic Resources in the Library that can be accessed through ICT Facilities

The findings as presented in Table 4:10 show that Strathmore University Library subscribes to various electronic resources. These include but not limited to electronic books, electronic journals, Online Public Access Catalogue (OPAC), institutional repository, online databases, and Ask a Librarian. It can be reckoned that the SUL subscribes to various electronic resources and that some electronic resources are more known and heavily used than others.

In concurrence with this statement, the References Librarian stated that SUL subscribes to several electronic resources from different renowned publishers on various subjects that are in line with degree courses offered, hence such initiative has gone a long way in assisting postgraduate students with the necessary digital literacy skills to explore, access and utilized electronic resources to enhance and attain their academic goal. In addition, the University Librarian revealed a substantial budgetary allocation of over two million shillings every financial year for the renewal of the subscription to electronic resources and for a well-established information/digital literacy training program to improve access and usage of electronic resources.

The findings of the study are in line with the results of the study by Bashorun et al. (2011) which revealed that academic staff and postgraduate students possessed digital literacy skills which led to the utilization of these resources ranging from electronic journals, online reference works, online catalogue, electronic books, and bibliographic databases. Ugwulebo and Okuonghae (2021) corroborate the findings by asserting that electronic resources are information-bearing materials that require the use of electronic or computer technology to appreciate their contents, including electronic databases, e-books, e-journals, online newspapers and website content.

In essence, information literate users can easily use traditional books and other printed information resources, but they will require some particular skill (digital literacy skills) to utilize electronic resources effectively. Nonetheless, Omekwu and Nwafor (2014) argue that the availability of e-resources does not necessarily illicit utilization; instead, it requires users' awareness and digital literacy skills for adequate access and usage of electronic resources. To this end, they call for the library staff and postgraduate students to equip themselves with digital literacy skills.

Although Ndubisi and Jantan (2003) advocate for computing skills as a requirement in accessing and using electronic resources, they reason that having basic digital literacy skills is not a total guarantee that postgraduate students will have to make use of electronic resources. Therefore, postgraduate students who have adequate digital literacy skills still needed specific training on how to navigate online information searching for accessing and using electronic resources. In tandem with the provision of the Student's Digital Literacy Model by Beetham and Sharpe (2011), which supports that at the access level of the model, students need to access subscribed electronic resources by the library, institutional ICTs and the Internet, and thus should have higher expectations for institutions of higher learning to provide them with the access they need.

5.4.6 How Electronic Resources are Accessed by Postgraduate Students

The findings on access to electronic resources by postgraduate students presented in Table 4.11 reveals that although a majority of the respondents from Strathmore University accessed library e-resources by physically visiting the library, they were also able to access remotely from cyber café, their place of comfort, remotely from outside the library but within the university campus and finally from remotely from outside the university campus. Accessing electronic resources through physically

visiting the library and remotely within the university campus was rated more highly than other options because Strathmore University offers free Wi-Fi internet with good connectivity speed, leading to the improved usage of electronic resources.

This view is consistent with the argument advanced by a study done by Kamau et al., (2018) on access to and use of ICTs in the provision of information to distance learners in Kenyan Universities which revealed that a significant proportion of respondents accessed the university library's e-resources by physically visiting the library or through remote access.

5.4.7 Purpose for Using Electronic Resources

The results of this study indicated that the majority of postgraduate students with digital literacy skills use electronic resources for their coursework, to do an assignment, to find relevant information in their area of specialization, to prepare for seminar presentations, revise for examinations, for writing proposals and research purposes, except a small percentage of 17(9%) respondents used electronic resources to publish articles as shown in Table 4.12.

This implies that postgraduate students need information when they are in a situation requiring knowledge to deal with the situation in context as they deem fit and carry out their academic tasks successfully. The findings concur with the views of the respondents interviewed indicating that electronic resources were beneficial and excellent for teaching, learning and research purposes. These findings can be interpreted to mean that situation and task are contextual elements that affect the purpose of using electronic resources by postgraduate students.

These results of the study are harmonized with those of Addisalem (2016) in a study on the Use of Electronic Resources by Postgraduate Students at UNISA which

established that most postgraduate students use electronic resources for their coursework, an assignment, preparing for examinations, writing proposals, conducting literature reviews for the master's and doctoral theses, and research purposes. Similarly, Deng (2010) corroborates with the views of Addisalem (2016) by indicating that users have various purposes for the use of e-resources, which include, amongst others, gathering information on a specific topic, gaining general information, obtaining answers to specific questions, completing assignments, reviewing the literature, writing essays, and making decisions.

These findings equally support the Horizontal Pyramid Model by Ndubisi and Jantan (2003) which is based on Technology Acceptance Model by Davis (1989), stating that if postgraduate students have computing skills and know that the electronic resources are likely to meet their information needs, they will make use of electronic resources for publishing articles, completing an assignment, finding relevant information in their area of specialization, and learning. The model implies that postgraduate students should perceive electronic resources as being relevant and valuable to them and able to meet their information and research needs.

5.4.8 ICT Policy in Place to Promote Access and Use of Electronic Resources

The results of this study indicated that the majority of postgraduate students 172 (93.5%) agreed with the existence of an ICT policy at Strathmore University while 12 (6.5%) were not aware of the existence of an ICT policy that supports access and use of electronic resources. It was disappointing to note that none of the respondents were aware of the electronic resources policy. These findings concur with the findings from the interviews where all library staff confirmed that although there was a comprehensive University ICT policy, it was a general policy for the entire University that guides the use of ICT infrastructures and as well as promoting digital

literacy training for users it did not narrow down specifically to access and use of electronic resources subscribed by the library.

A possible explanation of these findings suggests that even though there was a well-articulated ICT policy at Strathmore University library to integrate and adopt ICTs, as well as promote digital literacy skills training necessary to support efficient research process and academic activities by students and academic staff, the policy didn't integrate or support for electronic resources subscription as well as training on access and use of electronic resources databases. The findings correspond with Ingersoll and Culshaw (2004) who believe that institutional ICT policies are put in place by the university library to encourage access to and use of computers and ICTs infrastructures to utilize electronic resources in the library.

Results from interviewing University Librarian further revealed that Strathmore University library had no electronic resources policy for the acquisition, access and use of electronic resources. However, the library relies on the broad University ICT policy and the broad collection development policy as a guideline on how to access and use electronic resources. This result could be attributed to the absence of an electronic resource policy that would guide subscription, electronic resources training and the creation of awareness.

The possible explanation for these results might be that SUL has not developed an effective institutional policy to facilitate access to and use of electronic resources. This implies the establishment of an electronic resources policy that covers electronic resource training, acquisition, access and use of electronic resources, which will go a long way in providing electronic information services to postgraduate students to support research and academic activities. This view is

consistent with the argument advanced by Ocholla (2006) that electronic resources policy addresses different online databases needed for acquisition, training issues, and whether the library should join a consortium or not towards meeting users' information needs and satisfaction. In essence, the electronic resources policy will go a long way in providing electronic resources which improve the quality of learning and research output of users.

These findings further advance the Model for Student's Digital literacies by Beetham and Sharpe (2011), which states that at the access level of the model, institutional ICT and electronic resources policies guide and supports postgraduate students with relevant digital literacy skills to access institutional ICT infrastructures and electronic resource subscribed by the library. In this respect, whatever ICT infrastructure and electronic resources are to be accessed should be within the existing institutional policy and that restrictions are imposed.

5.5 Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources

Having a well thought of digital literacy training programmes for students, academicians, and information professionals is the only way to improve and boost skills and competence and become effective users of electronic resources (Ugwulebo & Okuonghae, 2021).

5.5.1 Availability or Absence of Digital Literacy Training Programmes for Postgraduate Students to Access and Use Electronic Resources

According to Muhinja (2013), training users in ICT skills is essential and inevitably necessary for the effective use of electronic resources; therefore, a good training program is necessary to enhance postgraduate students' digital literacy skills. The

findings of the study showed that majority of the postgraduate students and library staff interviewed indicated that the library had digital literacy programmes that offer skills development through online orientations, web-based tutorials, online users' instructions, computer literacy information searching, workshops, seminars and online training on electronic resources databases. Thus, the general view of the above is that SUL had digital literacy programmes to support access and use of electronic resources.

An interview done with the Reference Librarian revealed that information literacy had been embedded with the communication skills units as a course taught in the University which covers topics such as search skills on the various electronic resources database, locating information resources, how to evaluate the information sources and using them effectively and ethically. Furthermore, digital literacy training programmes are usually ongoing throughout the year and postgraduate students are exposed to digital literacy skills and the vast amount of online information which enables them to access and use electronic resources at SUL.

These findings on the digital literacy training programme fully support the Horizontal Pyramid Model by Ndubisi and Jantan (2003) that information resources users need effective training on using electronic resources. If trained well, they will appreciate the role of ICTs, digital literacy skills and electronic resources in research and teaching. If postgraduate students struggle to access electronic resources due to inadequate digital literacy training programmes, they get frustrated and discouraged.

These findings support, Gakibayo et al., (2013) who explain that there is the need to equip end-users with skills such as information and digital literacy skills, information retrieval skills, and computer skills among others as a strategy to promote the usage

of electronic resources especially among academic libraries for effective utilization of electronic resources. This view is backed by Dolo-Ndlwana, (2013), who suggests that information retrieval skills are critical and significantly impact the users' ability to use electronic resources. With such digital literacy skills, postgraduate students and library users can use electronic resources effectively.

Furthermore, the findings established that almost half 91(49.46%) of postgraduate students indicated that they could not apply the knowledge and digital literacy skills they had acquired from the training on access and use of electronic resources and this was an indication that the digital literacy training program had not earned them enough knowledge or skills to apply in searching for e- resources, while 93 (50.54 %) could apply the knowledge and skills earned. Therefore, this study's findings show that the digital literacy training program benefited almost half of the postgraduate students in acquiring the skill required to enhance their utilizing electronic resources. This means that a good number of postgraduate students need to be taken back through digital literacy skills programs to equip them with adequate digital literacy skills again to enable them to master the necessary skills needed for adequate access and utilization of electronic resources.

The study established that almost half of the postgraduate students were ill-equipped. Therefore, there is a need to establish a continuous digital literacy programme to equip postgraduates with digital literacy, information retrieval and computer skills to promote access to and use of electronic resources, especially among postgraduate students in University. Hence this study concurs with the sentiments of Muhinja (2013) that training users on ICTs skills are essential, a continuous process and, therefore inevitably necessary for the effective use of electronic resources. Therefore, the study concludes that the digital literacy training program at SUL is a one-off

digital literacy programme which makes it inadequate, resulting in the underutilization of electronic resources. SUL should strategically organize a continuous digital literacy programme to take care of library users who require the service to access and use electronic resources effectively.

5.5.2 Digital Literacy Training Needs of Postgraduate Students of Strathmore University

Using ICTs to access and use electronic resources involve special skills that cannot be ignored thus these skills can only be acquired through proper digital literacy training and guidance. It is believed that limited skills and lack of electronic resources searching skills limit postgraduate students' use of electronic resources as per studies by Majd and Abazova (1999). The sub-theme aimed at finding out if postgraduate students had received any digital literacy training that might help postgraduate students to access and use electronic resources as stated in the Horizontal Pyramid Model of Ndubisi and Jantan (2003) that computing skills of a user will strongly determine his or her usage of information systems.

The findings established that the majority of postgraduate students, 175(95.0%) who participated in the study had received ICT training on accessing and utilizing electronic resources as shown in Table 4.13. These findings align with a study by Ugwulebo and Okuonghae (2021) on Information Literacy Skills and Utilization of Electronic Information Resources by Postgraduate Students in Nigeria that found that digital literacy training among postgraduate students is helpful for adequate access and usage of electronic resources in university libraries since the most recent and up-to-date information is electronically available. Findings from an interview found that all the key informants collectively stated that they had received training on the use of ICTs to search, retrieve, access, download, save and use electronic resources.

On the other hand, the absence of digital literacy training would explain to some extent why some 9(5.0%) of postgraduate students were not able to fully exploit and utilize electronic resources. Postgraduate students with a digital literacy skills gap require assistance or help while using computers and online resources. Thus, the findings suggest that postgraduate students and library staff still need digital literacy and electronic resources training to improve their skills, competence, access and use.

This is endorsed by the findings of Okello-Obura and Magara (2008) in a study on Electronic Information Access and Utilization by Makerere University Students in Uganda which revealed that users with limited digital literacy skills in the use of computers could encounter difficulties in accessing and using electronic resources subscribed by the library. Therefore, digital literacy training on using ICTs to access and use electronic resources is necessary.

On the other hand, the library and ICTs staff have to equip postgraduate students with adequate training to effectively and efficiently use electronic resources as stated in the Horizontal Pyramid Model by Ndubisi and Jantan (2003) based on Technology Acceptance Model by Davis 1989. In applying this model, low usage of electronic databases is attributed to the insufficient computer skills and knowledge and also inadequate training of patrons in electronic database access and use.

Computing skills are seen as the expertise necessary for postgraduate students to use electronic resource databases and also undergo digital literacy training which involves online orientation, e-tutorials, workshops or support given to postgraduate students in electronic database use and access. The study found that postgraduate students needed more digital literacy training to search for information online, save, retrieve, download and use electronic resources. In support of the Horizontal

Pyramid Model (2003), the absence of digital literacy training affirms the study's assumption that low usage of electronic resources is likely due to limited digital literacy training of users and the absence of basic computer skills and an absence of electronic resources searching skills.

5.5.3 Digital Literacy Training Setup

The study revealed that a good number of postgraduate students, 156 (85.0%) had received training from the classroom setting, followed by 22(12.0%) of them answering that they had received one-on-one training, while 6 (3.0%) had received their training in computer-based training. The findings are in agreement with Constable's (2007) findings on Training Needs for Electronic Information Use in the College of Law at the University of South Africa, which established that they are various training methods through which postgraduate students could be trained and including; face-to-face training, user manuals and computer-assisted instruction, as well as alternatives to training such as transparent and simplified systems, all suggest that the best way to teach online searching is to take people by the hand and, in an intimate and relaxed setting, show them how to search. Therefore, there are several possible explanations for these results, including the need to develop and offer regular classroom orientation training programs to effectively access and use electronic resources. Thus, from the study, there are several ways postgraduate students can be trained to use ICTs to access and effectively utilize electronic resources.

5.5.4 Adequacy of the Digital Literacy Training Program on the Use of Electronic Resources

The study revealed that a significant number of postgraduate students, 81(44%), felt that the digital literacy training programs were inadequate and suggested that the

library staff's training on electronic resources was inadequate and ineffective. Therefore, there is a need for postgraduate students to acquire the required digital literacy skills to assist them maximum utilize electronic resources. This proves that most postgraduate students at Strathmore University library have inadequate digital literacy skills, limiting the maximum utilization of electronic resources. This could mean that the training offered did not suit their needs.

This view is consistent with the argument advanced by Kavulya (2003) and Somi & De Jager, (2005) in their studies on Information Literacy Activities that established that the failure on the part of librarians was not to push for information literacy as the fore function of the University library as well as engaging in information literacy activities but still the students had difficulty finding, critically evaluating and using information resources.

5.5.5 Training of Digital Literacy and Access and Use of Electronic Resources

The majority of the respondents stated that training was conducted by SU library staff as revealed by 168(91.3%) postgraduate students. The finding suggests that the librarian plays an important role in training and providing users with the first experience in facilitating access and use of electronic resources at Strathmore University library. This shows that library staff should continue training library users, which points to the fact that knowledge sharing on the use of technology to access and use electronic resources is important.

The current findings support a study by Chibini (2011) on the Use of Electronic Journals by the Academic Staff of Strathmore University which reveals that most of the lecturers had received training from the library staff. This could indicate that the

librarian's role has shifted from merely providing information to being proactive in training their users to access and utilize electronic resources.

Heller (2002) claims that training the trainer means identifying an existing staff person, or several staff members, who have some technology expertise and teaching this person to train other staff members to use the technology. This means that library staff at SU responsible for training should receive further training themselves before transferring any acquired knowledge to library users. Training the trainers, such as subject librarians and any other qualified library personnel, will ensure that the library stays abreast of its training programmes.

5.6 Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library

The benefit of digital literacy skills by postgraduate students and librarians cannot be underestimated because of the recent technological development and the digital transition that is gradually taking over the information space. Several challenges reduce the extent to which digital literacy skills would have promoted postgraduate students' quest to use electronic resources for their academic work due to inadequate digital literacy skills which limit the utilization of electronic resources.

From the results presented in chapter four, numerous findings emerge. The majority of respondents revealed the following challenges: poor internet connectivity, power outages, inadequate digital literacy skills, limited subscribed titles from electronic resources databases, inadequate technological infrastructure, system incompatibility, network delays, technophobia, network issues outdated technology, information overload, inadequate digital technology training/practice, network delays, minimal

assistance by the librarian, an embargo on some articles, insufficient digital literacy skills and passwords and user names on some of the electronic resources databases as a hindrance to access and use of electronic resources by postgraduate students of Strathmore University.

Findings from the University Librarian indicated that the library faced several challenges and cited the following as challenges: lack of or minimal funds allocated to support library professionals training on digital literacy skills/electronic resources training, non-attendance of training workshops, insufficiency of workstations, shortage of skilled system librarian at the University at the moment, this research was conducted, who can train both on digital literacy training and electronic resources and unreliable internet connectivity a time when several users are trying to access and use electronic resources subscribed by the library.

An interpretation of the findings suggests that the postgraduate students face several challenges in accessing and using electronic resources that can be traced to include infrastructural and human factors and personal level of digital literacy skills. In turn, these factors affect their utilization of electronic resources (Lwoga et al., 2016). A similar situation has been observed by Madhusudhan (2010) who asserts that the low access speed of the Internet was a common problem for postgraduate students faced when accessing electronic resources. This may serve as an obstruction to learning and research work, especially for postgraduate students.

In Ojeniyi and Adetimirin, (2016) view, limited access to a computer, poor internet connection, erratic power supply, lack of technical know-how, technophobia, and difficulty using search terms are the factors militating against digital literacy skills in utilizing technology to access and use electronic resources. Hamad et al. (2021)

investigated Jordan academic library professionals regarding the effect of librarians' digital technology and skills and in their study, and they found that the librarian faced many challenges in learning new digital skills, such as limited funds for attending workshop training and a lack of financial support and time.

5.7 Measures to Improve Digital Literacy Skills to facilitate Access and Use of Electronic Resources

The research not only focused on the identified challenges in applying digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University library but also proposed measures for improvement. Postgraduate students proposed some intervening measures to improve on digital literacy skills to access and use electronic resources at Strathmore University library that include: need for users information/digital literacy and electronic resources training to be carried out throughout the year especially one-on-one training as well as group training; promotion and marketing of electronic resources; improve on computer speed and internet connectivity by acquiring brand new modern computer which will be a improve the speed of computers; providing a dedicated bandwidth for the library that would increase speed of downloading of articles; subscription for electronic resources with restricted access; adequate power supply and acquiring power backup like a generator to support library operation in case of power outages; digital literacy programs should be included in the curriculum at Strathmore University, especially to undergraduates, postgraduate students, and the academic staff so that they can be trained on digital literacy skills needed for accessing electronic resources.

The staff interviewed indicated that the library needs to subscribe to more titles from electronic resources databases. University should solve the embargo problem for

some publishers to lift it, offer digital literacy and electronic resources training to library staff to boost their competencies, and empower them to train library users on how best to use ICTs to access and use electronic resources. Furthermore, the SU library needs to develop a partnership with the government and ICT companies to provide ICT infrastructures and digital literacy training in institutions of higher learning. SUL needs to source adequate funds for electronic resources and digital literacy programs, digital literacy training, procurement of modern infrastructure, and establish and implement an electronic resource policy to support access and use of online resources.

A consensus view by Udoh et al. (2020) in a study on Digital Literacy Skills of Undergraduate Students of Library and Information Science on the Utilization of Electronic Information Resources in Two Federal Universities in Nigeria suggest that design and implementation of digital literacy programmes to educate and train students to develop their knowledge on the use of ICTs was paramount, IT lecturers should provide practical-based teaching and communication skills that will drive interest and motivate the acquisition of digital literacy skills by their students. Therefore, the universities should provide functional digital infrastructures like computers and internet facilities in order to prepare their students for global competitiveness in the present information-saturated world, decision-makers in governments should formulate policies to regulate prices of digital tools and facilities and to improve electricity power supply in order to enable universities and their students maximize the use of their digital tools for the advancement of their digital literacy skills.

In line with a study done by Emiri (2015) on Digital Literacy Skills among Librarians, it suggests that; training librarians to update their knowledge in the

application of digital skills, digital literacy skill competence should be given more attention during recruitment of librarians, avail human and technical resources that are up to date in university libraries to encourage librarians to use the resources, library and organizational management to invest more in digital libraries services/skill development and the need also for university libraries management to define clear policies and strategies concerning information communication technology for library services.

5.8 Chapter Summary

Chapter Five presented an interpretation and discussion of the research findings presented in Chapter 4. The interpretation and discussions followed by the thematic areas are in line with the study objective that is underpinned by the study Model of Student's Digital Literacies by Beetham and Sharpe (2011) and the Horizontal Pyramid Model advanced by Ndubisi and Jantan (2003) based on the Technology Acceptance Model by Davis (1989). The chapter therefore gives meaning and provides implications for the finding presented in Chapter Four. The research findings indicated that postgraduate students have different levels of digital literacy skills, which are inadequate, resulting in unequal access to electronic resources, ICT and digital literacy skills to a very large extent, facilitate adequate access and use of electronic resources; ICTs facilities at SUL were inadequate. Although there were digital literacy training programs in place, they were inadequate and limited access and utilization of electronic resources.

The next chapter (Chapter Six) provides a summary of the findings, conclusion and recommendations.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The chapter presents a summary of the findings, the conclusion and recommendations on the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University Library. The purpose of the study was to investigate the application of digital literacy skills on access and use of electronic resources by postgraduate students of Strathmore University with the view to proposing interventions to improve digital literacy skills on access and use of electronic resources. The research findings have assisted in making informed conclusions based on research questions.

6.2 Summary of the Findings

The summary of findings covers the investigation on the level of digital literacy skills on access and use of electronic resources by postgraduate students, establish the extent to which ICT and digital literacy skills help to facilitate adequate access and use of electronic resources, find out the type of digital literacy training programmes in place for postgraduate students in facilitating access and use of electronic resources, identify challenges faced by postgraduate students concerning digital literacy skills on access and use of electronic resources and suggest ways of improving digital literacy skills to facilitate access and use of electronic resources.

6.2.1 Background information of the respondents

The study found that almost an equal number of the postgraduates were from either sex, with males 98 (53.3%) and females 86 (46.7%). The study revealed that most postgraduates were aged 26-30 years, with current education being undertaken ranging from a Master's degree 181 (98.4%) to a Ph.D. degree 3(1.6%). The study

revealed that a majority of respondents, 97(52.7%), were in their first year of study. The findings further revealed that 93 (50.5%) postgraduate students were full-timers, whereas 91(49.5%) were part-timers. The study also revealed that most postgraduates had used the library for shorter periods, with 108 (53%) indicating one year. Further, the study results revealed that the library had a University librarian, deputy university librarian, librarian and senior library assistant, with 1 (17%) of the respondents indicating employment for less than one year. In comparison, 4(83%) of the library staff have been employed for more than 4 years, indicating that the library is rich in terms of experienced and qualified staff. Finally, the study's findings revealed that 3(60%) of library staff held Master's degree qualifications whereas the remaining 2(40) % of respondents were split, with 1(20%) respondents having doctorates and the same percentage holding a postgraduate diploma.

6.2.2 Level of Digital Literacy Skills of Postgraduate Students

The study's findings show that respondents have different levels of digital literacy skills resulting in unequal access and use of electronic resources, with most postgraduate students and library staff rating their level of digital literacy skills as intermediate hence pointing towards minimum utilization of electronic resources (See Chapter 4 section 4.4.1).

The study results revealed the different digital literacy skills possessed by postgraduate students included: knowledge on how to use computers to access and download files from electronic resources databases, online information searching, locating and navigating the electronic resources database, Internet surfing, sending and receiving emails, using social media, using keyword phrases and advanced searching techniques (see results presented in section 4.4.2).

On the other hand, all the key informants collectively stated that their different levels of digital literacy skills possessed enable them to: have electronic resources database search skills, digitization of print information resources, send and receive emails, upload documents online platforms like an institutional repository, use social media, using KOHA Library Management Systems, library website development skills and access to open-sources software. The findings further indicated that digital literacy skills of postgraduate students had improved their academic performance by enabling them to access a wide range of information, access up-date-date information, use email and social media, download, save, retrieve, print, have confidence in using computers, and use Google scholar and other databases for studies and research.

The findings of the study showed that the majority of the respondents had an inadequate digital literacy skill which in turn limits access and utilization of electronic resources and this implies that their ability to search, retrieve and use electronic resources minimizes utilization of scholarly and research work (Chapter 4 section 4.4.3). This could have been attributed to the absence of general computer skills, difficulties using software interfaces, and difficulty in developing a search strategy. Such challenges have robbed most university students at all levels of their academia the great opportunities to utilize digital literacy skills in accessing and using electronic resources. This means there is a gap in postgraduate students' digital literary skills, which could influence or cause low utilization of electronic resources.

6.2.3 Application of ICT and Digital Literacy Skills in Facilitating Adequate

Access and Use of Electronic Resources

The findings revealed that postgraduate students and library staff with digital literacy skills had access to Strathmore University ICTs facilities (see Chapter 4 section 4.5.1) that provides a range of services and electronic resources such as databases,

journals and electronic books which are essential for postgraduate students to conduct research and complete their assignments. Furthermore, the findings revealed that the majority of postgraduate students agreed that ICT and digital literacy skills supported expanded access to electronic resources databases and improved learning opportunities by supporting postgraduate students in carrying out their academic tasks with ease.

The study found that the ICT facilities at Strathmore University Library, such as computers, laptops, projectors, scanners, and internet connectivity, were inadequate for all users to access, resulting in unequal access and limited utilization of electronic resources. (Chapter 4 section 4.5.2). This suggests that investing in modern computers, internet connectivity, and subscribing to electronic resources may not be justified if the necessary electronic resources cannot be accessed and retrieved due to a lack of or inadequate ICT facilities.

The findings revealed that a good number of postgraduate students felt a gap in their digital literacy skills and would likely require some assistance or help while using the computer to access electronic resources. In other words, they were not experienced in using computers and carrying online searches resulting in unequal access and usage of electronic resources and struggled with basic computer task and may require assistance while accessing electronic resources. This call for Strathmore University Library to organize digital literacy training to up skills and re-skills both postgraduate students and staff to improve their knowledge on using of computers, connecting to the internet, and carrying out online searches to enhance and improve access and usage of electronic resources. Concerning electronic resources, the findings revealed that Strathmore university library subscribes to several electronic resource databases (Chapter 4 section 4.5.5) from renowned publishers and for

various subjects that are in line with degree courses offered and can be utilized by postgraduate students who have acquired the necessary digital literacy skills. It is also evident, from the findings that some electronic resource databases were underutilized thus putting to task library staff of Strathmore University to enhance digital literacy training and create awareness of underutilized electronic resources databases to improve their usage by postgraduate students.

Regarding the purpose of using electronic resources, the findings established that postgraduate students with digital literacy skills use them to satisfy their various information needs which include; undertaking research, completing assignments, seminar presentations, finding relevant information in their area of specialization, publishing articles for their coursework, preparing for examinations, writing proposals, conducting literature reviews for the masters and doctoral theses.

The findings revealed that although there was a comprehensive University ICT policy, it was a general policy for the entire University that guides the use of ICT infrastructures and as well as promoting digital literacy training for users. However, the ICT policy did not underpin specifically on access and use of electronic resources subscribed by the library since electronic resources policy was absent making Strathmore University library rely on the broad University ICT policy as well as the broad collection development policy as a guideline on how to access and use of electronic resources. The absence of electronic resources policy and procedures could significantly result in limited access and use of electronic resources.

6.2.4 Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources

Concerning the availability of digital literacy training programmes at Strathmore University library, the findings revealed that the training programmes that offer the following: skills development through online orientations, web-based tutorials, online users instructions, computer literacy information searching, workshops, seminars and online training on electronic resources usage are usually ongoing throughout the year. The library users are equipped with digital literacy skills and exposed to the vast amount of online information that stimulates access and use of electronic resources for academic and research purposes.

It was also established that information literacy had been embedded with the communication skills units as a course taught in the University by a librarian whereby students at all levels of their study are made aware of electronic resources, introduced to searching skills on the various electronic resources database, locating information resources, evaluating the information sources and using them effectively and ethically.

The findings further revealed that almost half of the postgraduate students indicated that they could not apply the digital literacy skills and knowledge they had acquired from the training and this was an indication that the digital literacy training program had not earned them enough knowledge or skills to apply in searching for electronic resources. With these in mind, the library needs to organize for continuous user education in digital literacy skills for postgraduate students in order to equip them with adequate digital literacy skills required for accessing and utilizing electronic resources.

The study found that although a large number of postgraduate students confirming they had received training some still lacked digital literacy skills as explained by five percent postgraduate students could not fully exploit and utilize electronic resources. This was due to a gap in digital literacy training and as a result, these students would likely require assistance or help using computers, laptops, internet connectivity and perform online searches to access and use electronic resources. As a result, these students should be incorporated into the ongoing digital literacy and electronic resources training that take place throughout the year to improve their skills and be competent in computer and information searching skills.

The finding also revealed that a good number of postgraduate students, had received training in the classroom setting, while others had received one-on-one and computer-based training. From the findings of this study, all respondents indicated that they had received training on electronic resources (See chapter four sections 4.6.2). However, the findings revealed that there is need to expand the scope of training to accommodate other relevant online databases and emerging search strategies. The study further established that postgraduate students needed to have training on information searching strategies on to facilitated utilization of various electronic resources available at SUL.

The findings further revealed that digital literacy training programs at Strathmore University library were inadequate, as indicated by a significant number of postgraduate students (See chapter four sections 4.6.4). This suggests that the training offered by the library staff on the use of electronic resources was inadequate and ineffective which led to underutilization of electronic resources. In addition, the study also suggests that the digital literacy training offered then did not suit their needs and with these in mind, postgraduate students could not acquire the digital

literacy skills to help them access and utilize electronic resources. This proves that most postgraduate students at Strathmore University had inadequate digital literacy skills, which minimized utilization of electronic resources. The overall results showed that most training were conducted by SUL staff as indicated by the majority of postgraduate students. This placed librarian as essential in training and providing postgraduate students with firsthand experience in facilitating access and using electronic resources.

6.2.5 Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library

The findings established that postgraduate students faced challenges relating to the application of digital literacy skills impeding adequate access and utilization of electronic resources. Such challenges as: inadequate digital literacy skills which limit access and utilization of electronic resources, unreliable internet connectivity, inadequate ICTs infrastructure especially computers, scanners, unstable internet connectivity, digital literacy training programmes. On the other hand, librarians are overwhelmed with some postgraduate students who do not understand how to search and use e-resources; library staff digital literacy skill inadequate; an absence of electronic policy; insufficiency of workstations and institutional repositories occasionally not working among others.

To address these challenges, the following interventions were proposed: SUL should organize regular digital literacy training to improve the level of digital literacy skills of postgraduate students and staff; acquire modern computers, scanners, printers; improve on internet connectivity in the University; advocacy on the use of electronic resources; establishing and implementing and electronic resource policy that will

support ICT policy on the use of computers and internet to explore and use of electronic resources and embedding digital literacy programs in the university curriculum to train postgraduate students and staff on the use of electronic resources.

6.3 Conclusion

This section provides conclusions based on the major findings of the study. The conclusions were drawn in the order in which the research questions were presented.

The findings point out that postgraduate students and library staff have different levels of digital literacy skills, with a majority of them having moderate skills resulting in unequal access to and use of electronic resources. The conclusion drawn from this finding is that the digital literacy skills of postgraduate students of Strathmore University library are inadequate hence limit access and utilization of electronic resources. The overall findings established that ICT facilities such as computers in Strathmore University Library were inadequate for usage by all the users resulting in unequal access and limited utilization of electronic resources considering the growing population of students every academic year.

Additionally, as much as there was a comprehensive University ICT policy, it was a general policy for the entire University that guided the use of ICT infrastructures and as well as promoting digital literacy training for users and it did not narrow down specifically to access and use of electronic resources subscribed by the library. The absence of an electronic resources policy as hampered the establishment and implementation of guided digital literacy training, advocacy and also provides guidelines for the selection, acquisition, subscription of electronic resources.

The overall findings indicate that despite the existence of digital literacy programmes, both postgraduate students and library staff still lacked adequate digital

literacy skills. Further, it also emerged that the library's current digital literacy training programs at SUL are inadequate as evidenced by postgraduate students' inability to apply and acquire necessary skills to maximize their use of electronic resources.

The study finally noted that postgraduate students experience several challenges while using ICTs to utilize electronic resources which included; inadequate digital literacy skills which limit access and utilization of electronic resources, unreliable internet connectivity, inadequate ICTs infrastructure especially inadequate ICTs infrastructure, inadequate and ineffective digital literacy training programmes, limited subscribed titles from electronic resources databases, outdated technology, information overload, inadequate digital literacy skills training and embargo on some articles. These challenges severely limit the effective use of electronic resources and frustrate students in their academic pursuits. The study concluded that the general status of digital literacy skills of postgraduate students of Strathmore University library is inadequate and hence limits the utilization of electronic resources. In view of this, the study provided recommendations to improve the use of electronic resources at Strathmore University Library.

6.4 Recommendations

Based on the findings of this study, the following recommendations are put forward to improve the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University library with a view to suggesting measures for improvement. The study recommends the following strategies for consideration as proffered in sections 6.4.1 to 6.4.3 below.

6.4.1 Level of Digital Literacy Skills of Postgraduate Students

The study revealed that postgraduate students have different digital literacy skills, resulting in unequal access and use of electronic resources.

Recommendation 1: incorporate a digital literacy skill program and electronic resources training in the University curricular

The study strongly recommends that Strathmore University Management should incorporate, design and implement digital literacy programmes and electronic resource training into University curricula. This will provide the postgraduate students with the necessary skills and knowledge on the use of computers, internet and performing online searches to access and use electronic resources for quality learning and research (Malik & Ameen, 2007). The collaboration of librarians, lecturers and ICT staff is necessary to develop integrated digital literacy programmes that will boost the level of digital literacy skills possessed by students, upgraded their skills, improve access and utilization of electronic resources. By doing so, postgraduate students will be equipped with the necessary digital literacy skills required to effectively access and utilize electronic resources.

Recommendation 2: SU management should support and finance

Strathmore University management should prioritize the allocation of sufficient funds to support digital literacy training programs, subscription of electronic resources, and acquisition of modern ICT facilities. This funding should cover various aspects, including training programs, infrastructure procurement, and ongoing maintenance and updates (Anyim, 2018) Adequate financial support will ensure that the library has the necessary resources to develop and sustain comprehensive digital literacy initiatives.

6.4.2 Application of ICT and Digital Literacy Skills in Facilitating Adequate Access and Use of Electronic Resources

The overall findings established that most postgraduate students agreed that ICT and digital literacy skills greatly facilitate adequate access and use of electronic resources. However, the study revealed that ICT facilities in Strathmore University Library were inadequate.

Recommendation 1: Strathmore University Should Acquire and improve ICT Infrastructure in the library

The study recommends that SU through the ICT and the library systems department should improve its ICT infrastructure to enhance postgraduate students' access and use of electronic resources. This can be achieved by increasing the internet network connectivity through provision of higher bandwidth, increase the number of computers (Malanga & Chigona, 2018). Strathmore University should also acquire modern computers and upgrade the wireless connections with various hotspots to accommodate the growing demand from postgraduate students who use their laptops to access electronic resources. By doing so, SU will ensure a conducive environment for postgraduate students to access and utilize electronic resources.

Recommendation 2: Advocacy and awareness of existing and upcoming electronic resources.

The study recommends that librarians at SUL should engage in massive advocacy and awareness campaigns to promote the availability and use of electronic resources. While the study found that some marketing of electronic resources is currently being done, it is important for the SUL to evaluate its marketing strategies and incorporate modern trends such as social media to reach a wider audience. The library should

also collaborate with academic departments to ensure that postgraduate students are aware of the electronic resources available for their research and coursework. This library can ensure that postgraduate students receive comprehensive information about electronic resources relevant to their research and coursework (Zuniga, 2022). By increasing advocacy and awareness of existing and upcoming electronic resources, SUL can ensure that postgraduate students are equipped with the necessary information to access and utilize these resources effectively. To keep pace with the rapidly evolving technological landscape, SUL should embrace emerging technologies and incorporate them into their advocacy efforts.

Recommendation 3: Establish and implement an electronic resources policy

The study recommends that librarians SUL should establish and implement an electronic resources policy to guide the acquisition, selection and management of electronic resources accessible via the Internet. Such a policy will help to establish consistency and prevent conflicts in resource management and provide clear selection criteria for determining which databases to offer and which to avoid. This should include strategies for evaluating the quality and reliability of online resources, as well as ensuring that users have access to relevant and up-to-date resources. In addition, the policy should outline how the library will maximize access to and use of electronic resources, including providing remote access, offering training and support for optimal use, and collaborating with other institutions to expand access to resources. This will ensure that users are able to effectively navigate the library's electronic resources and make the most of the available tools and information. This will help to ensure that the library's electronic resources continue to meet the needs of its users and remain aligned with the institution's goals and objectives. Overall, the development and implementation of an electronic resources policy at Strathmore

University Library will support the provision of high-quality services and resources to users, and promote efficient and effective management of electronic resources.

6.4.3 Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources

The study revealed that although a digital literacy programme was in place, they were inadequate and postgraduate students still needed to be trained to access and use electronic resources.

Recommendation 1: Promote and offer Digital literacy and electronic resources training

In today's digital age, digital literacy has become an essential skill for academic success. The recommendation to provide regular and effective digital literacy training for postgraduate students is crucial for enhancing their access and use of electronic resources. These programs should cover a range of topics, including database searching techniques, critical evaluation of online information, citation management, data analysis tools, and copyright and intellectual property considerations. The training should be offered in various formats, such as workshops, online tutorials, or one-on-one sessions, conducted in-person or online, and they allow for hands-on practice, group discussions, and direct guidance from librarians or subject matter experts. By equipping them with digital literacy skills, they will appreciate the role of information and communication technologies (ICTs) in accessing and using electronic resources for research and academic work.

To achieve this goal, librarians and IT staff should collaborate to develop and offer regular user education and training programs that cover various aspects of digital literacy. These programs should focus on skills such as adequate access to electronic

databases, searching and retrieving information, downloading articles, connecting computers to the internet, internet searching, and current awareness. Postgraduate students need training on using online information resources effectively to improve their research and learning outcomes. Thus, a well-designed digital literacy training program that caters to their specific needs and requirements is vital. Such training programs should be tailored to meet the different learning styles and preferences of the students, as well as their academic disciplines. In addition to providing digital literacy training to postgraduate students, it is also essential to extend this training to academicians and information professionals. Digital literacy training programs for all stakeholders in the academic community will not only boost their skills and competence but also ensure they become effective users of electronic resources.

Recommendation 2: Advocacy for Digital Literacy training programme.

The study recommends that SUL should actively advocate for the implementation of a comprehensive digital literacy training program. Advocacy efforts should focus on raising awareness among stakeholders, including lecturers, staff, and postgraduate students, about the importance of digital literacy skills in today's information-driven society.

The study recommends that in order to support equitable access and use of electronic resources, it is crucial for librarians and other custodians of knowledge to conduct advocacy and awareness campaigns around the importance of digital literacy skills. This includes staying up-to-date with emerging technologies and incorporating them into digital literacy training programmes. To effectively advocate for digital literacy, librarians should highlight the impact that digital literacy skills can have on individuals and communities, such as improved employability, better access to information. In addition, librarians should work to incorporate a range of digital tools

and resources into their training programmes, such as online databases, social media, and mobile devices. This can help to ensure that individuals from diverse backgrounds and with varying levels of technological proficiency are able to benefit from the training. Overall, by prioritizing digital literacy and advocating for its importance, librarians can help to bridge the digital divide and ensure that everyone has the skills and resources they need to succeed in a rapidly changing technological landscape.

Recommendation 3: The University Management should employ more information professionals with ICT skills

The study also recommends that the university management should employ more information professionals with ICT skills capable of supporting users in acquiring digital literacy skills, internet literacy skills, and information literacy to not only access electronic resources but also be in a position of operating computer, connect to the wireless network, local area network, install software, do online searches, repair some basic computer hardware failure, communicate using email, video conferencing among others.

These professionals should possess a solid understanding of digital technologies, database management, electronic resource systems, and emerging trends in the field. By recruiting individuals with a combination of information science knowledge and ICT competencies, the library can effectively address the technical challenges associated with managing, training, accessing and use of electronic resources.

6.5 Contribution and Originality of the Study

According to Wassenaar (2006), for research to be of value, it should address issues important to a particular society, community or institution. The research questions

addressed in this study were of value to Strathmore University Library and other academic libraries in Kenya who have made significant investments to support teaching, learning and research work through subscription of electronic resources, well-laid and established digital literacy training programmes and a technology-based environment that requires the acquisition of digital literacy skills by postgraduate students and other library users to access and use electronic resources to gain new knowledge which could be used to generate a unique solution to current challenges facing Kenya and the rest of the world.

From a pragmatic perspective, the findings uncovered and created awareness about the need and importance of those digital literacy skills among postgraduate students which plays a critical role in accessing and effectively using electronic resources. In this regard, the recommendation adduced by students and library staff can be espoused to improve or implement digital literacy training programmes to library users of SUL to enhance maximum utilization of electronic resources. In the wake of technology advances, there is an increasing demand for individuals to possess digital skills, especially in academia as it enables them to conduct research, gather information, stay up-to-date with the latest developments in their field of study, use various online platforms and tools to share their research with a wider audience, collaborate with other researchers, and receive feedback on their work. Pragmatic benefits will be: to improved access to information, increased research productivity, enhanced learning outcomes and increased competitiveness.

For theory, the study contributes to the domain of knowledge and literature, especially in the context of digital literacy skills and how they relate to accessing and using electronic resources in SU and other institutions of higher learning. Moreover, extant literature on digital literacy skills tends to concentrate on primary and

secondary education globally with little regard if any to institutions of higher learning in Kenya. This study recognizes the unique challenges and opportunities that postgraduate students of SU face in accessing and using electronic resources, especially as more libraries and institutions move towards online and hybrid learning models. The current study therefore examined the application of digital literacy skills by postgraduate students on access and use of electronic resources at SUL thus contributing new knowledge and literature and new and innovative views of discussing theories underpinning the study opening up new areas for research.

Furthermore, literature reviewed revealed that application of digital literacy skills by postgraduate students to access and use electronic resources in Kenya institutions of higher learning is given little attention as attested by majority of postgraduate students who indicated their digital literacy as being inadequate and limits utilization of electronic resources. Studies such as one done by Subaveerapandiyani et al., (2022) on digital literacy skills among African library staff and information science professionals support the current study. The current study is therefore significant in contributing to the scholarly research and literature on application of digital literacy skills by postgraduate students to access and use electronic resources.

6.6 Suggestion for Further Research

The present study investigated the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University Library with a view to suggesting measures for improvement. The study investigated Strathmore University Library. However, there are other academic libraries in Kenya that have made significant investments to support teaching, learning and research work through subscription of electronic resources. Hence, there is the need for a well-laid and established digital literacy training programmes and a technology-

based environment that requires the acquisition of digital literacy skills by library users to access and use electronic resources. The current study was conducted at a private university in Kenya, whose situation may be slightly different to those of public universities, in terms of funding and management. In this regard, future research could be extended to public universities in Kenya, among others. Future research could focus on conducting longitudinal studies that track the development of digital literacy skills among postgraduate students over time. This would help assess how students' proficiency evolves throughout their academic journey and how exposure to electronic resources and digital tools influences their literacy over time.

REFERENCES

- Abbas, Q., Hussain, S., & Rasool, S. (2019). Digital literacy effect on the academic performance of students at higher education level in Pakistan. *Global Social Sciences Review*, 4(1), 154–165.
- Abdullah, K. (2009). Barrier to successful integration of ICT in teaching and learning environment: A review of literature. *Eurasia Journal of Mathematics Science and Technology* 5(3): 235-245.
- Abiddin, N. Z., Ibrahim, I., & Aziz, S. A. (2022). Advocating digital literacy: Community-based strategies and approaches. *Academic Journal of Interdisciplinary Studies*, 11(1), 198–198.
- Abrosimova, G. A. (2020). Digital literacy and digital skills in university study. *International Journal of Higher Education*, 9(8), 52–58.
- Abubakar, D., & Chollom, K. M. (2017). Relationship of user education, computer literacy and information and communication technology accessibility and use of e-resources by postgraduate students in Nigerian university libraries. *Libr. Philos. Pract*: 555
- Addisalem, G. D. (2016). The use of electronic information resources by postgraduate students at UNISA Regional Learning Centre in Ethiopia (Doctoral dissertation).
- Adeleke, D. S., & Emeahara, E. N. (2016). Relationship between information literacy and use of electronic information resources by postgraduate students of the University of Ibadan. *Library philosophy and practice*, 1.
- Adeleke, D. S., & Nwalo, K. I. N. (2017). Availability, use and constraints to use of electronic information resources by postgraduate's students at the University of Ibadan. *International Journal of Knowledge Content Development & Technology*, 7(4), 51–69.
- Adeoye, A. A., & Adeoye, B. J. (2017). Digital literacy skills of undergraduate students in Nigeria universities. *Libr. Philos. Pract*, 1665.
- Ainley, J., Schulz, W., & Fraillon, J. (2016). *A global measure of digital and ICT literacy skills*.
- Akussah, M., Asante, E., & Adu-Sarkodee, R. (2015). Impact of electronic resources and usage in academic libraries in Ghana: Evidence from Koforidua Polytechnic & All Nations University College, Ghana. *Journal of Education and Practice*, 6(33), 33–38.
- Ali, N. (2005). The use of electronic resources at IIT Delhi Library: a study of search behaviours. *The electronic library*, 23(6), 691-700.
- Alladin (2001). Theories of ICT-Based learning and teaching available at: <http://www.mirandanet.ac.uk/tta/interim.htm> (accessed 27 June 2017).

- Almeida, F. (2018). Strategies to perform a mixed methods study. *European Journal of Education Studies*.
- Alqudah, M. A., & Muradkhanli, L. (2021). Electronic management and its role in developing the performance of e-government in Jordan. *Electronic Research Journal of Engineering, Computer and Applied Sciences*, 3, 65–82.
- Amankwah, P. B. (2014). Use of Electronic Resources by undergraduate students of the Ghana Institute of Management and Public Administration (GIMPA). Unpublished master's thesis). University of Ghana, Accra.
- Ani, O. E., Ngulube, P., & Onyancha, B. (2014). Effect of accessibility and utilization of electronic information resources on productivity of academic staff in selected Nigerian universities. *Science Research*, 2(6), 166–171.
- Anjaiah, M. (2016). Digital information literacy among research scholars and student's community at Dravidian University, Kuppam-Andra Pradesh (India): An exploratory study. *IOSR Journal of Humanities and Social Science*, 21(09), 01–08.
- Ankrah, E., & Atuase, D. (2018). The use of electronic resources by postgraduate students of the University of Cape Coast. *Library Philosophy and Practice*, 1-37.
- Antoninis, M., & Montoya, S. (2018). A global framework to measure digital literacy. Blog UNESCO. <http://uis.unesco.org/en/blog/global-framework-measure-digital-literacy>
- Anyim, W. O. (2018). Assessment of ICT literacy skills of digital library users and staff in Salem University Lokoja, Kogi. *Library Philosophy and Practice*, 0_1.
- Anurogo, D., La Ramba, H., Putri, N. D., & Putri, U. M. P. (2023). Digital Literacy 5.0 to enhance multicultural education. *Multicultural Islamic Education Review*, 1(2), 109–179.
- Australia Education Network. (2000). *Learning in an online world: School education action plan for the information economy*. Retrieved March, 18, 2002.
- Azzahra, N. F., & Amanta, F. (2021). *Promoting digital literacy skill for students through improved school curriculum*. Policy Brief.
- Babbie, E. R., Halley, F., & Zaino, J. (2007). *Adventures in social research: data analysis using SPSS 14.0 and 15.0 for Windows*. Pine Forge Press.
- Babbie, E., & Mouton, J. (2010). *The practice of social research*. Cape Town: Oxford University Press
- Bartol, T., Dolničar, D., Podgornik, B. B., Rodič, B., & Zoranović, T. (2018). A comparative study of information literacy skill performance of students in agricultural sciences. *The Journal of Academic Librarianship*, 44(3), 374–382.

- Bashorun, M.T., Isah, A., & Adisa, M. Y. (2011). User perception of electronic resources in university of Ilorin, Nigeria (UNILORIN). *Journal of Emerging Trends in Computing & Information Sciences*, 2(11), 557-562
- Beetham, H., & Sharpe, R. (2011). Digital literacies workshop. Paper presented at the JISC learning literacies workshop, Birmingham [online]. Retrieved December7, 2017 from <http://jiscdesignstudio/performance>. Exploring the digital divide. *Information*, 13(3), 129.
- Bhattacharjee, A. (2012). *Social science research: Principles, methods, and practices*. USA.
- Blakes, E. F. (2006). ICT availability and resource sharing in some academic libraries in Nigeria. *Libraries: Dynamic Engines for the Knowledge and Information Society*, 94.
- Blummer, B., & Kenton, J. M. (2015). Academic Librarians ‘use of Web 2.0 Tools and New Media to Promote Students ‘information Literacy Skills. *Journal of Education Research*, 9(2).
- Bola, O. O., & Ogunlade, O. O. (2012). Accessibility and utilization of internet service by graduate students in university of Lagos, Nigeria. *European Researcher*, 7, 1092–1098.
- Bosire, E. (2011). Access and use of information communication technologies (ICTs) for rural poverty reduction in Uasin Gishu district (Doctoral dissertation, Moi University).
- Chibini, V. M. (2011). Use of electronic journals by academic staff at Strathmore University (Dissertation, Moi University).
- Christensen, S., Mikkelsen, L., Fels, J., Bodvarsdottir, T., & Hansen, A. (2009). Quality of plasma sampled by different methods for multiple blood sampling in mice. *Laboratory Animals*, 43(1), 65–71.
- Christy, E. B., & Yusuf, D. T. (2022). An Investigation of the Level of Digital Literacy Skills Possessed By Academic Librarians in Nigerian Universities.
- Cln, R. E., & Cln, E. O. (2021). Digital Literacy Skills as correlate of Electronic Information Resources (EIRS) Use by University Undergraduates in South, Nigeria. *Library Philosophy and Practice*, 1–16.
- Cohen, L. M., & Manion, L. (2014). *Morrison [2011] Research Methods in Education*. London–New York: Routledge, 10, 9780203720967.
- Constable, F. T. (2007). Training needs for electronic information use in the college of law at the University of South Africa (Doctoral dissertation).
- Cooper, D., & Schindler, P. (2011). *Business Research Methods*. Boston: McGraw-Hill.
- Creswell, J. W. (2008). *Mixed Methods Research: Design and Procedures*. Los Angeles: Sage.

- Creswell, J. W. (2012). *Education Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research*. 4th (ed.). Boston, MA: Pearson.
- Creswell, J. W. (2013). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. 3rd (ed.). Thousand Oaks, California: Sage.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and mixed Methods Approaches*. 4th ed. Thousand Oaks, California: Sage.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Creswell, J. W., Klassen, A. C., Plano Clark, V. L., & Smith, K. C. (2011). *Best practices for mixed methods research in the health sciences*. Bethesda (Maryland): National Institutes of Health.
- Dadzie, P. S. (2007). Information literacy: Assessing the readiness of Ghanaian universities. *Information Development*, 23(4), 266–277.
- Daly, J. A. (2003). The higher education information infrastructure in Africa, available at <http://www.cidcm.umd.edu/library/papers/jdaly/dalypaer1.html> (accessed 28 may 2018)
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.
- Davis, F.D., Bagozzi, R., & Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, 35(8), 982-1003.
- De Vos, A. S., Delport, C. S. L., Fouche, C., & Strydom, H. (2011). *Research at grass roots: A primer for the social science and human professions*. Van Schaik Publishers.
- Deng, H. (2010). Emerging patterns and trends in utilizing electronic resources in a higher education environment: An empirical analysis. *New library world*, 111(3/4), 87-103.
- Dolo-Ndlwana, N. (2013). Use and value of library's electronic resources by academics and postgraduate students at Cape Peninsula University of Technology (CPUT) (Master's thesis, University of Cape Town).
- Eden, C. A., Chisom, O. N., & Adeniyi, I. S. (2024). Promoting digital literacy and social equity in education: Lessons from successful initiatives. *International Journal of Management & Entrepreneurship Research*, 6(3), 687–696.
- Ekenna, M. M., & Mabawonku, I. (2013). Information retrieval skills and use of library electronic resources by university undergraduates in Nigeria. In *Information and Knowledge Management* (Vol. 3, No. 9, pp. 6-14).
- Emiri, O.T. (2017). Digital literacy skills among librarians in university libraries in the 21st century in Edo and Delta states, Nigeria *IJLIS*, Vol. 6, pp. 37-52.

- Esfahani, M. T., & Vahidi, B. (2012). A new stochastic model of electric arc furnace based on hidden Markov model: A study of its effects on the power system. *IEEE Transactions on power delivery*, 27(4), 1893-1901.
- European Commission (2022). Digital agenda for Europe: A Europe 2020 initiative. Available from <http://ec.europa.eu/digital-agenda/digital-agenda-europe>
- European Commission. (2004). e-Europe Action Plan 2004: An Information Society for All. Retrieved from <https://eEurope> - An information society for all (europa.eu)
- European Commission. (2021). Digital Education Action Plan 2021-2027: Resetting Education and Training for the Digital Age. Retrieved from <https://education.ec.europa.eu/focus-topics/digital-education/action-plan>.
- European Commission. (2023). European Universities Initiative factsheet: 4EU+. <http://education.ec.europa.eu/sites/default/files/document-library-docs/european-universitiesfactsheet-4euplus.pdf>. Accessed 2 May 2023-search (bing.com)
- Eves, C. & Dalziel, P. (2007). Personal communication from the commerce self-review committee. Lincoln University. *Commerce Division*, 23(1), 3-6.
- Gakibayo, A., Ikoja-Odongo, J.R., & Okello-Obura, C. (2013). 'Electronic information resources utilisation by students in Mbarara University Library', *Library Philosophy and Practice (e-journal)* 869, 1–26, viewed 20 June 2016 from <http://digitalcommons.unl.edu/libphilprac/869/>
- Ganapathy, M., & Kaur, S. (2015). Using Beetham and Sharpe's (2011) model in analysing the digital literacy practices of ESL students in an institution of higher learning. *Malaysian Journal of Languages and Linguistics (MJLL)*, 4(1), 31–42.
- Giddens, A. (2017). *Modernity and Self-Identity: Self and Society in the Late Modern Age*. Polity Press.
- Glister, P. (1997). *Digital literacy*. New York: John Wiley.
- Graham, P. L., Notz, W. I., Pearl, D. K., & Stasny, E. A. (2003). Electronic resources: The Ohio state university EESEE project. *Journal of Applied Mathematics and Decision Sciences*, 7(2), 85–92.
- Greene, J. C. (2007). *Mixed methods in social inquiry* (Vol. 9). John Wiley & Sons.
- Hague, C., & Williamson, B. (2009). *Digital participation, digital literacy, and school subjects: A review of the policies, literature and evidence*. Future lab.
- Hamad, F., Al-Fadel, M., & Fakhouri, H. (2021). The effect of librarians' digital skills on technology acceptance in academic libraries in Jordan. *Journal of Librarianship and Information Science*, 53(4), 589–600.

- Harwell, M. R. (2011). Research design: Qualitative, quantitative, and mixed methods: Pursuing ideas as the keystone of exemplary inquiry. In *The Sage handbook for research in education: Pursuing ideas as the keystone of exemplary inquiry*. Sage.
- Heller, D. (2002). Train the trainer: affordable option brings knowledge in-house. Online: <http://www.techsoup.org/learning/training/page5060.cfm>. (Accessed: 08/02/2020).
- Hennessy, S., Harrison, D., & Wamakote, L. (2010). Teacher factors influencing classroom use of ICT in Sub-Saharan Africa. *Itupale Online Journal of African Studies*, 2(1), 39–54.
- Huges, J. M. (2008). The performative pulls of research with the new media. *International journal of qualitative methods*, Vol .7, no.2, pp 16-34.
- ICT Authority. (2017). *What is Digital Literacy Programme?* Ministry of Information, Communications and Technology.
- Ingersoll, P., & Culshaw, J. (2004). *Managing Information Technology*, Libraries Unlimited, Westport, CT.
- Ismail, A., Abiddin, N. Z., & Hassan, A. (2011). Improving the Development of Postgraduates' Research and Supervision. *International Education Studies*, 4(1), 78–89.
- Issa, A. O., Blessing, A., & Daura, U. D. (2009). Effects of information literacy skills on the use of e-library resources among students of the University of Ilorin, Kwara State, Nigeria. *Library philosophy and practice*, 12(2).
- Jacard, J., & Jacob, J. (2010). *Theory construction and model-building skills: a practical guide for social scientists*. New York: Guilford.
- Johnson, R. B., Onwuegbuzie, A., & Turner, L. (2007). Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research*, 1 (2), 112-133.
- Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010). Net generation or Digital Natives: Is there a distinct new generation entering university? *Computers & Education*, 54(3), 722–732.
- Jun, F. U., & Pow, J. (2011). Fostering digital literacy through web-based collaborative inquiry learning—A case study. *Journal of Information Technology Education. Innovations in Practice*, 10, 57.
- Kainth, G., & Kaur, G. (2010). *Integration of ICT in teacher education*. Available at <http://www.zunia.org/.../integration-of-ict-in-teacher-education>. Retrieved July, 2, 2012.
- Kamau, G. W., Kiplang'at, J., & Odingi, C. (2018). Access to and Use of ICT's in the Provision of Information to Distance Learners in Kenyan Universities. URI: <http://hdl.handle.net/123456789/1708>

- Kari, R. (2004). *Use of electronic resources by undergraduate students at perpustakaan Tun Abdul Razak 1 UiTM Shah Alam* (Doctoral dissertation, University of Malaya).
- Kaur, N. (2014). Effectiveness of multimedia approach in teaching of Arts at secondary stage. *Edutracks*, 13(8): 17-19.
- Kavulya, Muema J. (2003). Challenges facing information literacy efforts in Kenya: A case study of selected university libraries in Kenya. *Library Management*, 24(4/5), 216-222.
- Keith, K. D., & Bonham, G. S. (2005). The use of quality of life data at the organization and systems level. *Journal of Intellectual Disability Research*, 49(10), 799-805.
- Kerlinger, F. (1996). *Foundations of behavioural research*. New York: Holt Rhinehart and Winston.
- Kombo, D.K. (2006). *Proposal and Thesis Writing*. Nairobi, Pauline Publication Africa.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.
- Kothari, S. P. (2011). The benefits of financial statement comparability. *Journal of Accounting research*, 49(4), 895-931.
- Laanpere, M. (2019). Recommendations on Assessment Tools for Monitoring Digital Literacy within UNESCO's Digital Literacy Global Framework. UNESCO Institute for Statistics. Information Paper No. 56. UIS/2019/LO/IP/56. <http://uis.unesco.org/sites/default/files/documents/ip56-recommendations-assessment-tools-digital-literacy-2019-en.pdf>
- Lacey, F. M., Matheson, L., & Jesson, J. (2011). Doing your literature review: Traditional and systematic techniques. *Doing Your Literature Review*, 1–192.
- Law, N., Woo, D., de la Torre, J., & Wong, G. (2018). A global framework of reference on digital literacy skills for indicator 4.4.2. *UNESCO Institute for Statistics*.
- Leedy, P.D., & Ormrod, J.E. (2005). *Practical Research: Planning and Design*. 8th (ed.). Upper Saddle River, NJ: Pearson Merrill Prentice Hall.
- Li, M., & Yu, Z. (2022). Teachers' Satisfaction, Role, and Digital Literacy during the COVID-19 Pandemic. *Sustainability*, 14(3), 1121.
- Lwoga, E. T., & Sife, A. S. (2018). Impacts of quality antecedents on faculty members' acceptance of electronic resources. *Library Hi Tech*, 36(2), 289-305.

- Lwoga, E.T., Sife, A.S.; Busagala, L.S.P. & Chilimo, W. (2016). The role of universities in creating ICT awareness, literacy and expertise: Experiences from Tanzanian public universities. Directorate of ICT support, Makerere University Uganda.
- Machin-Mastromatteo, J. D. (2021). Information and digital literacy initiatives. *Information Development*, 37(3), 329–333.
- Madhusudhan, M. (2010). Use of electronic resources by research scholars of Kurukshetra University. *The electronic library*, 28(4):492-506
- Majd, M. A., & Abazova, M. D. (1999). The role of gender in education: A contextualized analysis of Kyrgyzstan and Kazakhstan. *Comparative Education Review*, 43(1), 70-90.
- Malanga, Donald; Chigona, Wallace (2018). “Digital Information Literacy of Undergraduate Students in Higher Education Institutions in Malawi: Challenges and Policy Implications”, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3274573.
- Malik, A., & Ameen, K. (2017). Library/information education programs in Pakistan: a comparison with IFLA Guidelines. *Library Review*, 66(4/5), 297-309.
- Manduku, J., Kadenyi, A., & Kosgey, A. (2012). Integrating ICT in curriculum delivery for digital content: Lessons from the Kilgoris kindle schools project in Kenya. In ICERI2012 Proceedings (pp. 2195-2201).
- Mansour, E. (2017), “A survey of digital information literacy (DIL) among academic library and information professionals”, *Digital Library Perspectives*, 33(2), 166-188.
- Marianti, S., Rufaida, A., Hasanah, N., & Nuryanti, S. (2023). Comparing item-total correlation and item-theta correlation in test item selection: A simulation and empirical study. *Jurnal Penelitian Dan Evaluasi Pendidikan*, 27(2), 133–145.
- Marshall, C., & Rossman, G. B. (1999). *Designing Qualitative Research*, Thousand Oaks, CA: Sage, 1999.
- Martin, A. (2006). Literacies for the digital age. In A. Martin & D. Madigan (Eds.), *Digital literacies for learning* (pp. 3-25). London: Facet Publishing
- Maslow, A. H. (1943). A theory of human motivation, *Psychological Review*, 50, (4), 370-396. [doi:10.1037/h0054346](https://doi.org/10.1037/h0054346).
- Maxwell, J. C. (2013). *The 17 indisputable laws of teamwork: Embrace them and empower your team*. Nashville: Harper Collins Leadership
- Mayo, E. (2004). *The human problems of an industrial civilization*. Routledge.
- McLaughlin, J. E., & Bush, A. (2016). Mixed methods: Expanding research methodologies in pharmacy education. *Currents in Pharmacy Teaching and Learning*, 8(5), 715-721.

- Mikkelsen, B. (2009). *Methods for Development Work and Research: A New Guide for Practitioners* (2ed.) New Delhi: Sage Publications
- Ministry of Education Kenya. (2016). *National ICT strategy for Education and Training*. Nairobi: Ministry of Education
- Mirzaei, F., & Sarrafzadeh, M. (2020). Proposed content framework for digital literacy education to users in Iran. *Human Information Interaction*, 7(3), 31–49.
- Moghadami, M., Malekolkalami, M., & Senapathy, M., & Mantegh, H. (2021). "Evaluation of Digital Literacy and Knowledge Competencies of Iranian Academic Librarians". *Library Philosophy and Practice (e-journal)*. 6480. <https://digitalcommons.unl.edu/libphilprac/6480>
- Mohammadyari, S., & Singh, H. (2015). Understanding the effect of e-learning on individual performance: The role of digital literacy. *Computers & Education*, 82, 11-25.
- Mole, A. J. (2017). Assessment of academic utilization of online information resources by undergraduate students in university of Nigeria, Nsukka. *International Journal of Knowledge Content Development & Technology*, 7(3), 29–48.
- Morse, J. M., Niehaus, L., Wolfe, R. R., & Wilkins, S. (2006). The role of the theoretical drive in maintaining validity in mixed-method research. *Qualitative Research in Psychology*, 3(4), 279-291.
- Mubarak, F., & Nycyk, M. (2017). Teaching older people internet skills to minimize grey digital divides: Developed and developing countries in focus. *Journal of Information, Communication and Ethics in Society*, 15(2), 165-178.
- Mugenda, A. G., & Mugenda, A. G. (2008). Social science research: Theory and principles. Nairobi: *Applied*, 11-22.
- Mugenda, O. M. G. (1999). *Research methods: quantitative and qualitative approaches*. Nairobi: Acts press.
- Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative & qualitative apporaches* (Vol. 2, No. 2). Nairobi: Acts press.
- Mugera, L. W. (2019). Effectiveness of Information Communication Technology literacy skills in utilization of e-resources by fourth year undergraduate students at Karatina University Library (doctoral dissertation, Kenyatta University).
- Muhinja, W. S. (2013). *Constrains to utilization of electronic books by academic staff in private university libraries in Kenya*. Unpublished masters research project, Kenyatta University.
- Musangi, P. S. (2020). *Assessment of Re-engineering process of library services in Universities in Kenya* (Doctoral dissertation, Moi University).

- Mutula, S., & Wamukoya, J. (2007), *Web Information Management: A Cross Disciplinary Textbook*, United Kingdom: Chandos Publishers.
- Naik, U., Devaraj, S., & Kumari, U. (2018). Professional skills and soft skills for LIS professional in ICT era. *Qualitative and Quantitative Methods in Libraries*, 7(1), 147–160.
- Ndubisi, N. O., Jantan, M., 2003. Evaluating IS Usage in Malaysian Small and Medium-sized Firms using the Technology Acceptance Model. *Logistic Information Management*, 16(6), 440-450.
- Neuman, W.L. (2007). *Social Research Methods: Qualitative and Quantitative Approaches*. 4th (ed.). Boston: Ally and Beacon.
- Ng'eno, E. J. (2018). Research data management in Kenya's agricultural research institutes. Doctor of Philosophy (Information Studies) thesis, University of KwaZulu-Natal, Pietermaritzburg, South Africa.
- Ocholla, D. 2006. Information accessibility by the marginalised communities in South Africa and the role of libraries. Paper presented at the 72nd IFLA General Conference and Council. 20-24 August 2006. Seoul, Korea. [Online]. <http://hdl.handle.net/10150/105134>
- Ocholla, D. N., & Le Roux, J. (2011). Conceptions and misconceptions of theoretical frameworks in library and information science research: A case study of selected theses and dissertations from eastern and southern African universities. *Mousaion*, 29(2), 61–74.
- Odini, C. (1999). Training and development of skills in a changing information environment. *Lib. Manage.*, 20(2): 100-104.
- Odunewu, A. O., & Aluko-Arowolo, T. (2018). Information literacy, computer competence and use of electronic resources by Olabisi Onabanjo faculty members. *Journal of Information Engineering and Applications*, 8(4), 19–25.
- Ogolla, K. (2018). Digital Literacy Programme in Kenya; Developing IT Skills in Children to align them to the Digital World and Changing Nature of Work- Briefing Note.
- Ugwulebo, J., & Okuonghae, O. (2021). Information literacy skills and utilisation of electronic information resources by postgraduate students in Nigeria. *Library Philosophy and Practice (e-Journal)*, 1-20.
- Ojeniyi, A. O., & Adetimirin, A. E. (2016). ICT literacy skills and electronic information resources use by lecturers in two private universities in Oyo State, Nigeria. *Library Philosophy and Practice (e-Journal)*, 1443.
- Okello-Obura, C., & Magara, E. (2008). Electronic information access and utilization by Makerere University students in Uganda. *Evidence Based Library and Information Practice*, 3(3), 39–56.

- Olakulehin, F. K. (2007). Information and communication technologies in teacher training and professional development in Nigeria. *Turkish Online Journal of Distance Education*, 8(1), 133–142.
- Omekwu, C. O., & Nwafor, O. (2014). Availability and use of Information and Communication Technology Resources for People with Disabilities in Nnamdi Azikiwe Library, University of Nigeria, Nsukka. *Journal of Applied Information Science and Technology*, 7(2), 26–37.
- Omosekejimi, A. F., Brume-Ezewu, S., Brume-Ezewu, E. G., Nwobu, B. K., & Nweke, A. C. (2018). ICT and digital literacy skills: A mechanism for efficient teaching in Nigerian colleges of education. *Information Impact: Journal of Information and Knowledge Management*, 9(3), 57–71.
- Oseghale, O. (2023). Digital information literacy skills and use of electronic resources by humanities graduate students at Kenneth Dike Library, University of Ibadan, Nigeria. *Digital Library Perspectives*, 39(2), 181–204.
- Owansuan, J., & Soyemi, O. D. (2022). Digital Literacy Skills of Library and Information Science Undergraduates in South-West, Nigeria. *Library Philosophy & Practice (e-Journal)*: Article 7049. Available at: <https://digitalcommons.unl.edu/libphilprac/7049>.
- Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative social work*, 1(3), 261–283.
- Polit, D. F., & Beck, C. T. (2004). *Nursing research: Appraising evidence for nursing practice (7th Edition)*. Philadelphia: Wolters Klower/Lippincott Williams & Wilkins
- Ravitch, S., & Matthew, R. (2017). *Reason and rigor: how conceptual frameworks guide research (Second Edition)*. Los Angeles, CA: SAGE.
- Reddy, P., Chaudhary, K., & Hussein, S. (2023). A digital literacy model to narrow the digital literacy skills gap. *Heliyon*, 9(4).
- Republic of Kenya (2015). Digital Literacy Program [press release]. Retrieved from: Information, Communication and Technology Authority of Kenya website: http://www.icta.go.ke/downloads/digital_literacy_program_launch.pdf.
- Republic of Kenya. (2005). Sessional Paper No. 1 of 2005 on a Policy Framework for Education, Training and Research: Meeting the Challenges of Education, Training and Research in Kenya in the 21st century.
- Riolo, S. A., Nguyen, T. A., Greden, J. F., & King, C. A. (2005). Prevalence of depression by race/ethnicity: Findings from the National Health and Nutrition Examination Survey III. *American Journal of Public Health*, 95(6), 998–1000.

- Saeed, U.I., & Sheikh, R.A. (2011). Automation of University Libraries: A Comparative Analysis of Islamabad and Khyber Pukhtoon Khwa, Pakistan. *Library Philosophy and Practice*. Retrieved from <http://www.webpages.uidaho.edu/~mbolin/jan-sheikh.htm> on 8th September 2019.
- Sakwa, M. R. (2014). Access and use of electronic resources at Kenya investment authority (Doctoral dissertation, Moi University).
- Salaam, M.O., & Adegbore, A.M. (2010), "Internet access and use by students of private universities in Ogun state, Nigeria", *Library Philosophy and Practice (e-Journal)*, pp. 1-5.
- Salman, M., Mustafa, Z. U., Asif, N., Zaidi, H. A., Hussain, K., Shehzadi, N., Khan, T. M., & Saleem, Z. (2020). Knowledge, attitude and preventive practices related to COVID-19: A cross-sectional study in two Pakistani university populations. *Drugs & Therapy Perspectives*, 36(7), 319–325.
- Sarantakos, S. (2005). *Social Research, 3rd ed*, Palgrave Macmillan, New York.
- Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research methods for Business Students 6th (ed.)*. Edinburgh Gate, England: Pearson Education Limited.
- Sawe, E. C. (2017). *Analyzing information literacy needs of postgraduate students at Strathmore University, Kenya* (Doctoral dissertation). Strathmore University.
- Sejane, L. (2017). Access to and Use of Electronic Information Resources in the Academic Libraries of the Lesotho Library Consortium; thesis submitted to Information Studies Program, School of Social Sciences, College of Humanities, University of KwaZulu-Natal, Pietermaritzburg, South Africa
- Sharma, C. (2009). Use and Impact of e-Resources at Guru Gobind Singh Indrapratha University (India): A case study *Electronic Journal of Academic and Special Librarianship* 10 (1) 1 – 8
- Sharpe, R. (2014). What's at the top of the pyramid, 24th January 2014 Oxford Brookes University [online], Available at: <http://dlf.brookesblogs.net/archives/127> [Accessed 18 July 2014].
- Simon, M. K. (2011). Dissertation and scholarly research: Recipes for success. Dissertation Success, LLC.
- Sinha, P., & Ugwulebo, J. E. (2024). Digital literacy skills among African library and information science professionals—an exploratory study. *Global Knowledge, Memory and Communication*, 73(4/5), 521–537.
- Skyline College (2021). Information Literacy Skills. Retrieved from <https://skylinecollege.edu/library/informationliteracy/>
- Smith, A., & Johnson, B. (2023). Collaborating with academic departments for electronic resource awareness campaigns. *Journal of Library Collaboration*, 18(4), 220-238.

- Smith, J., Johnson, L., & Anderson, R. (2021). The Impact of Widespread Internet Access in Educational Institutions. *Journal of Educational Technology*, 45(3), 432-449.
- Smith, K. C., Ryoo, J. H., & Jang, B. G. (2021). Latent profiles of attitudes toward print and digital reading among adolescents. *Reading and Writing*, 34, 1115-1139.
- Somers, A. (2015). The use of electronic resources by postgraduate students and academics at the Graduate School of Business and Leadership, Westville Campus, University of KwaZulu-Natal.
- Somi, N. G., & De Jager, K. (2005). The role of academic libraries in the enhancement of information literacy: A study of Fort Hare Library. *South African Journal of Libraries and Information Science*, 71(3), 259–267.
- Stork, M. G. (2018). Implementing a digital learning initiative: a case study in K-12 classrooms. *Journal of Formative Design in Learning*, 2(1), 36-48.
- Strathmore University. (2018). *Strathmore University Annual Report*. Nairobi: Strathmore University
- Subaveerapandiyar, A., Sinha, P., & Ugwulebo, J. E. E. (2022). Digital literacy skills among African library and information science professionals—an exploratory study. *Global Knowledge, Memory and Communication*, ahead-of-print.
- Sulemani, S. B., & Katsekor, S. A. (2007). Information seeking behavior of health sciences faculty at the College of Health Sciences, University of Ghana. *Information Development*, 23(1), 63–70.
- Tamrakar, A. K., & Garg, R. G. (2016). User Perception Towards E-resources and Services of IIT-Guwahati Library. *DESIDOC Journal of Library & Information Technology*, 36(1).
- Tarus, J. K., Gichoya, D., & Muumbo, A. (2015). Challenges of implementing e-learning in Kenya: A case of Kenyan public universities. *The International Review of Research in Open and Distributed Learning*, 16(1)
- Tashakkori, A. (2009). *Foundations of mixed methods research: integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, Calif : Sage Publications
- Teddlie, C., & A. Tashakkori (2009). *Foundations of Mixed Methods Research*. Thousand Oaks, CA: Sage Publications.
- Tella, A., & Mutula, S. M. (2008). Gender differences in computer literacy among undergraduate students at the University of Botswana: Implications for library use. *Malaysian Journal of Library & Information Science*, 13(1), 59–76.

- Tlakula, T. P., & Fombad, M. (2017). The use of electronic resources by undergraduate students at the University of Venda, South Africa. *The Electronic Library*, 35(5), 861–881.
- Tsakonas, G., & Papatheodorou, C. (2006). Analyzing and evaluating usefulness and usability in electronic information services. *Journal of Information Science*, 32(5), 400–419.
- Tyckoson, D. A. (2011). Issues and trends in the management of reference services: A historical perspective. *Journal of Library Administration*, 51(3), 259–278.
- Udoh, I. U., Ekpenyong, G. & Olowookere, O. (2020). Digital Literacy Skills of Undergraduate Students of Library and Information Science on the Utilization of Electronic Information Resources in Two Federal Universities in Nigeria. *Library Philosophy and Practice*, 1-21.
- Ugwulebo, J., & Okuonghae, O. (2021). Information literacy skills and utilisation of electronic information resources by postgraduate students in Nigeria. *Library Philosophy and Practice (e-Journal)*, 1–20.
- UNESCO, (2018). A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2, Information Paper No.51, UIS/2018/ICT/IP/51, <http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf>
- Van Laar, E., van Deursen, A. J., van Dijk, J. A., & de Haan, J. (2020). Determinants of 21st-century digital skills: A large-scale survey among working professionals. *Computers in Human Behavior*, 100, 93-104
- Van Teijlingen, E., & Hundley, V. (2010). The importance of pilot studies. *Social research update*, 35(4), 49-59.
- Wambui, B. M., Nyambura, H., & Muriuki, N. (2022). *An Analysis on the Effectiveness of ICT Integration In Learning in Higher Education Institutions in Covid-19 Era*.
- Wassenaar, D. R. (2006). Ethical issues in social science research. *Research in practice: Applied methods for the social sciences*, 2, 60-79.
- Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010). Digital divides? Student and staff perceptions of information and communication technologies. *Computers & education*, 54(4), 1202-1211.
- Webometrics (2017). *Ranking web of universities*. Retrieved 20th January, 2017 from <https://webometrics.info/en/Africa>
- Wei, Y. (2022). *Digital Literacy in Education: From Local to Global*. 2726–2729.
- Wendo, D.R. (2014). Access to and use of electronic journals by students and academic staff at the United States International University Library Nairobi – Kenya (Masters dissertation, Moi University)

- Yin, R. K. (2009). *Case Study Research: Design and Methods, 4th edition*. Thousand Oaks, CA: Sage.
- Yo, N. (2021). Digital mathematical literacy as a component of the life skills of students of modern educational institutions. *The American Journal of Social Science and Education Innovations*, 378-384
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2003). Research methods. *Health economics research method*, 2.
- Zuniga, H. (2022). Accessibility and E-resources: Why it matters and what you can do. *The Serials Librarian*, 82(1-4), 103-108.

APPENDICES

Appendix I: Pre-Test Check List for Questionnaire and Interview Schedule

1. Are word spelt incorrectly? YES [] NO []

If YES, please indicate them in the questionnaire and interview schedule.

2. Is the font size used in the questionnaire and interview schedule legible?
YES [] NO []

If NO, please provide suggestions

3. Is the vocabulary used appropriate for respondents? YES [] NO []

If NO, please give suggestions.

4. Are there any questions in the schedule that are not clear? YES [] NO []

If YES, please mark them in the questionnaire and schedule and provide suggestions to improve clarity.

5. Is the sequence of questions flowing in the schedules? YES [] NO []

If NO, please provide suggestions.

6. Are all objectives adequately covered in the questionnaire and interview schedule?
YES [] NO []

If NO, please indicate the specific objective not adequately covered and give suggestions on the kind of questions to ask.

7. Kindly suggest any other ideas that will improve the quality of the questionnaire and interview schedule.

Appendix II: Questionnaire for Postgraduate Students

(Those who are expected to make considerable use of electronic resources)

I am a postgraduate student at Moi University. It is a requirement of the course to carry out a research project. The topic of the research is “Application of Digital Literacy Skills by Postgraduate Students to Access and Use electronic resources at Strathmore University Library.” The aim of this study was to investigate the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University library with a view to suggest measures for improvement.

I kindly request your participation in this study to enable me to collect data that will address the research problem under investigation. The answers to the questions and other information you provide will be held in strict confidence. Your answers will be completely anonymous, but your views, in combination with the others are extremely important in the above-named academic study.

Thanking you in advance for your time and cooperation.

Alfred Kiprop Masai

E-mail: alfredmasai@gmail.com Mobile No.: +254 720054000

Supervisor: Dr. Emily Ng’eno Email: ngenojeruto@gmail.com

Dr. Emily Bosire Email: emilykamboka@gmail.com

Section A: Demographics

The following questions are for analytical purposes only. They will not be used to identify any individual(s) Part one: Demographics

1. Postgraduate programme being undertaken

2. Gender:

☐ Male ☐ Female

3. Age:

☐ 20-25 ☐ 26-30 ☐ 31-35 ☐ 36 and Above

4. What is your level of education study?

☐ Masters ☐ PHD

5. Year of study?

☐ One year ☐ Two year ☐ Third year

6. Nature of study?

☐ Full-time ☐ Part-time

7. Length of usage of library by postgraduate students?

☐ One year ☐ Two year ☐ Three years

☐ More than four years

Section B

Level of Digital Literacy Skills of Postgraduate Students.

1. In your own opinion how would you rate your digital literacy competency level? Please tick (✓) one that best applies.

☐ Basic ☐ Intermediate /Average ☐ Advanced

2. Which digital literacy skills do you possess to enable you make use of e-resources? Please tick (✓) all that apply.

- ☐ Skills for accessing electronic resources
 - ☐ Electronic search and retrieval skills
 - ☐ Locating and navigating the electronic resources database
 - ☐ Internet surfing skills
 - ☐ Skills for downloading and saving articles from electronic resource databases
 - ☐ Basic Computer operations skills
 - ☐ Communication skills (sending and receiving email)
 - ☐ Participating in social networks for the creation and sharing of knowledge
 - ☐ Using keyword phrases to search for information on the internet
 - ☐ Using more advanced searching techniques than keywords
3. To what extent have the digital literacy skills you possess assist you in your academic work (Please state)?
-
-

4. How adequate are those digital literacy skills in terms of access and use of electronic resources?

☐ Very adequate ☐ Adequate ☐ Inadequate ☐ Very inadequate

5. How would you rate the impact of digital literacy skills on your academic performance?

☐ Very high ☐ High ☐ Moderate ☐ Low ☐ Very low

Examine the application of ICTs and digital literacy skills in facilitating adequate access and use of electronic resources

1. What are the ICTs facilities available for the acquisition of digital literacy skills in the library? (you may tick more than one)
- ☐ Tablets ☐ Smartphones ☐ Computers ☐ Laptops ☐ Scanners
- ☐ Projector ☐ Internet connectivity
2. How adequate are these ICT infrastructures for accessing and using electronic resources? Please tick (✓) one that best applies.
- ☐ Very adequate ☐ Adequate ☐ Inadequate ☐ Very inadequate

3. In what way can application of ICTs and digital literacy skills supported learning ? Please tick (✓) one that best applies.
- ☐ Online searching and retrieval of information
 - ☐ Access to electronic resource databases
 - ☐ Browsing and sharing of information
 - ☐ Online communication
 - ☐ Downloading and saving of online information
 - ☐ Online learning
 - ☐ Remote access to library electronic resources
 - ☐ Others (please specify) _____?
4. How can you rate your ability to use ICTs/computers to access and use electronic resources)? Please tick (✓) one that best applies.
- ☐ Excellent ☐ Very good ☐ Good ☐ Fair ☐ No skills
5. Which electronic resources are available in the library that can accessed using ICTs by postgraduate students who are digital literate?
- ☐ Electronic books
 - ☐ Electronic Journals
 - ☐ OPAC
 - ☐ CD-ROM databases
 - ☐ Institutional repository (Digital Repository)
 - ☐ Internet
 - ☐ Remote Access to Electronic resources (EZ Proxy)
 - ☐ Others (please specify) _____?
6. How or where do you access to electronic library resources from?
- ☐ Physically visiting the library
 - ☐ Remotely from a commercial cyber café
 - ☐ Remotely from my home
 - ☐ Remotely from my place of comfort
 - ☐ Remotely from outside the library but within the university campus

☐ Remotely from outside the library but outside the university campus

7. For what purpose do you use the electronic resources?

☐ Publishing articles

☐ Assignments

☐ Preparing notes

☐ Carrying out research

☐ Access to up to date information

☐ Faster access to information

☐ Others (please specify) _____?

8. Are there ICT policy in place to support use of ICT infrastructure on access and use of electronic resources?

☐ Yes ☐ No

Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources.

1. Does Strathmore University Library have a skill's development programmes?

☐ Yes ☐ No

2. Were you given any training in the library on the use of computers in searching for online information?

☐ Yes ☐ No

3. Are you able to apply the knowledge you acquired from the digital literacy Program in searching for electronic resources?

☐ Yes ☐ No

4. Which area did digital literacy programme concentrates on?

☐ E-books and Journals

☐ Online databases

☐ Institutional repository

☐ Online Public Access Catalogue

- ☐ Ask a Librarian
 - ☐ Remote Access
 - ☐ Online information searching and retrieval
 - ☐ Computer operations
 - ☐ Navigation of electronic resources database
 - ☐ Internet surfing
5. What kind of training did you undergo in using electronic resources?
- ☐ Classroom setting
 - ☐ User Instruction and ICT tutorials
 - ☐ One-on-one kind training setup
 - ☐ Computer-based training
6. How would you rate the kind training offered by the library staff on the use of electronic information resources?
- ☐ Very adequate ☐ Adequate ☐ Inadequate ☐ Very inadequate
7. From whom did you receive training from?
- ☐ Library staff ☐ Colleague/friends ☐ Self-study ☐ Training institutes

Challenges Experienced by Postgraduate Students Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library.

1. What do you think are the factors affecting digital literacy skills of postgraduate students on the utilization of electronic resources? Please tick (✓) all that apply.
- ☐ Insufficient digital literacy skills
 - ☐ Insufficient electronic resources search skills
 - ☐ Poor internet connectivity
 - ☐ Insufficient digital literacy and electronic resources training

- [] Information overload
- [] Limited subscribed title from electronic resources databases
- [] Power outages
- [] Use of out dated technology such old computer
- [] Inadequate technological infrastructure

Measures to Improve Digital Literacy Skills to facilitate Access and Use of Electronic Resources.

1. What Strategies should be employed to enhance digital literacy skills to enhance access and use of electronic resources

END

Thank you for your kind assistance and cooperation

Appendix III: Interview

Interview schedule for University Librarian and Library Staff (Those who are custodians and implementers of policies for access and use of electronic resources in the library, offering information literacy training to library users as well as ensuring smooth daily operation of the library)

I am a postgraduate student at Moi University. It is a requirement of the course to carry out a research project. The topic of the research is “Application of Digital Literacy Skills by Postgraduate Students to Access and Use electronic resources at Strathmore University Library.” The aim of this study was to investigate the application of digital literacy skills by postgraduate students to access and use electronic resources at Strathmore University library with a view to suggest measures for improvement.

I kindly request your participation in this interview to enable me to collect data that will address the research problem under investigation. The answers to the questions and other information you provide will be held in strict confidence. Your answers will be completely anonymous, but your views, in combination with the others are extremely important in the above-named academic study. Thanking you in advance for your time and cooperation.

Alfred Kiprop Masai

E-mail: alfredmasai@gmail.com Mobile No.: +254 720054000

Supervisor: Dr Emily Ng’eno Email: ngenojeruto@gmail.com

Dr Emily Bosire Email: emilykamboka@gmail.com

Section A: Demographics

Your designation

Working experience in years

Highest academic qualification

☐ Certificate ☐ Diploma ☐ Degree ☐ Masters ☐ Ph.D.

Section B

Level of Digital Literacy Skills of Postgraduate Students.

1. In your own opinion, how would you rate the level of digital literacy skills that you possess?
2. To what extent have the digital literacy skills you possess assist your library operation as well as assisting library users?
3. How adequate are those digital literacy skills in terms of access and use of electronic resources?
4. How would you rate the impact of digital literacy skills on your job performance as well as assisting library users to access and use electronic resources?

Examine the application of ICTs and digital literacy skills in facilitating adequate access and use of electronic resources

1. What are the ICTs facilities available for the acquisition of digital literacy skills in the library?
2. How adequate are these ICT facilities for accessing and using electronic resources?

3. To what extent can the use of ICTs facilitate access and use electronic resources?
4. How can you rate your ability to use ICTs to access and use electronic resources?
5. Which electronic resources are available in the library and can be accessed using ICTs?
6. How or where can users access to electronic library resources from?
7. For what purpose can electronic resources be used for?
8. Are there ICT policy in place to support use of ICT infrastructure on access and use of electronic resources?
9. Apart from ICTs policy is there and electronic policy in place?

Digital Literacy Training Programme for Postgraduate Students to Facilitate Access and Use of Electronic Resources

1. Does Strathmore University Library offer skills development programmes to library users on the use of ICTs to access and use electronic resources?
2. Does the library offer train users on the use of ICTs search, access and retrieve for online information?
3. Are you able to apply the knowledge you acquired from the digital literacy Program in searching for electronic resources?
4. Which areas are emphasized by the digital literacy and electronic resources training program
5. What kind of training did you undergo in using electronic resources?
6. How adequate is the training given to users at Strathmore University Library in the use of ICT to access and use electronic resources?
7. Who does the training to users?

Challenges Experienced Concerning Digital Literacy Skills on Access and Use of Electronic Resources at Strathmore University Library.

1. What are the challenges that affect acquisition of digital literacy skills of postgraduate students on the utilization of electronic resources?

Measures to Improve Digital Literacy Skills to facilitate Access and Use of Electronic Resources.

1. What Strategies should be employed to enhance digital literacy skills of postgraduate students to enhance access and use of electronic resources

THE END

Appendix IV: Authority from NACOSTI to undertake research

CONDITIONS	
1. The License is valid for the proposed research, research site specified period.	
2. Both the Licence and any rights thereunder are non-transferable.	
3. Upon request of the Commission, the Licensee shall submit a progress report.	
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.	
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.	
6. This Licensee does not give authority to transfer research materials.	
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.	
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.	



REPUBLIC OF KENYA

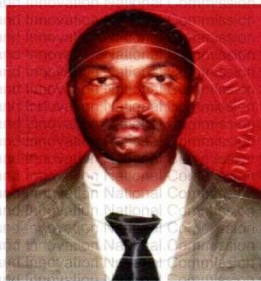


**National Commission for Science,
Technology and Innovation**

**RESEARCH CLEARANCE
PERMIT**

Serial No.A 15261

CONDITIONS: see back page

THIS IS TO CERTIFY THAT: MR. ALFRED KIPROP MASAI of MOI UNIVERSITY, 425-30302 LESSOS, has been permitted to conduct research in Nairobi County on the topic: ASSESSING DIGITAL LITERACY SKILLS IN ACCESS AND USE OF ELECTRONIC RESOURCES BY POSTGRADUATE STUDENTS OF STRATHMORE UNIVERSITY. for the period ending: 3rd August, 2018 Applicant's Signature	Permit No : NACOSTI/P/17/96784/17072 Date Of Issue : 3rd August, 2017 Fee Received :Ksh 1000  Director General National Commission for Science, Technology & Innovation
--	--

Appendix V: Ethical Clearance (Institutional Research and Ethics Committee)



MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471/2/3



MOI UNIVERSITY
COLLEGE OF HEALTH SCIENCES
P.O. BOX 4606
ELDORET

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

Reference: IREC/2017/165
Approval Number: 0002055

1st March, 2018

Masai Alfred Kiprop,
Moi University,
School of Medicine,
P.O. Box 4606-30100,
ELDORET-KENYA.



Dear Mr. Kiprop,

RE: FORMAL APPROVAL

The Institutional Research and Ethics Committee has reviewed your research proposal titled:-

"Assessing Digital Literacy Skills in Access and Use of Electronic Resources by Postgraduate Students of Strathmore University Library in Nairobi, Kenya".

Your proposal has been granted a Formal Approval Number: **FAN: IREC 2055** on 1st March, 2018. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; it will thus expire on 28th February, 2019. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN

INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc	CEO	-	MTRH	Dean	-	SOP	Dean	-	SOM
	Principal	-	CHS	Dean	-	SON	Dean	-	SOD

Appendix VI: Authority letter from Strathmore University



Strathmore
UNIVERSITY

4th April, 2018

Alfred K. Masai,
Masters' Student,
Moi University,
P. O. Box 3900,
Eldoret, Kenya.

Email: alfredmasai@gmail.com

Dear Alfred,

RE: AUTHORIZATION TO COLLECT DATA AT STRATHMORE UNIVERSITY

The Research Office at Strathmore University has granted you the authorization to collect data within the University. The authorization is effective from 9th April to 9th May, 2018. The data collection is for your Masters' Dissertation titled, ***"Assessing Digital Literacy Skills in Access and Use of Electronic Resources by Postgraduate Students of Strathmore University"***.

Mr. Phillip Kipruto at the Strathmore University Library has been assigned to supervise the process, during the aforementioned period. The questionnaires will be administered to (7) Library staff and to not more than (300) postgraduate students. For administrative reasons, the questionnaires shall not be administered to any postgraduate students at Strathmore Business School.

Please note that this is an administrative authorization and does not constitute an ethical approval of your research.

Please sign the declaration form binding you to the ethical use of the data you will access from Strathmore University (meant strictly for the purposes of your study).

Yours sincerely,

Prof. Izael Da Silva
Deputy Vice Chancellor - Research & Innovation

Appendix VII: Request to Conduct Research



MOI UNIVERSITY

DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT AND INFORMATION STUDIES

Tel: (053) 43231

Fax No: (053) 43292

Telex NO: 35047 MOIVASITY

E-Mail: hodlis@mu.ac.ke OR deanis@mu.ac.ke

P. O. Box 3900

Eldoret

Kenya.

Our Ref: IS/MS/LIS/27/13

13th April, 2017

The Executive Secretary,
Kenya National Council of Science and Technology,
P. O. Box 30623,
NAIROBI.

Dear Sir,

RE: MASAI ALFRED KIPROP – IS/MS/LIS/27/13

The above named is a Master of Philosophy student in the Department of Library, Records Management and Information Studies, School of Information Sciences, Moi University.

Mr. Kiprop is intending to carry out research work entitled *“Assessing Digital Literacy Skills in Access and Use of Electronic Resources by Postgraduate Students of Strathmore University”*.

We are kindly requesting you to issue him with a research permit to enable him proceed with his research.

Thank you. Kind regards

Yours sincerely,

Damaris



DR. DAMARIS ODERO
SENIOR LECTURER AND HEAD
DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT & INFORMATION STUDIES

DO/mn