**ASSESSMENT OF ICT SUPPORT SERVICES FOR RURAL STUDENTS A CASE OF OPEN UNIVERSITY OF TANZANIA AT RUKWA REGION**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT FOR THE REQUIREMENTS OF THE DEGREE OF MASTER OF EDUCATION IN OPEN AND DISTANCE LEARNING (MED-ODL)**

**DEPARTMENT OF ADULT EDUCATION**

**OF THE OPEN UNIVERSITY OF TANZANIA**

**2020**

# CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled; “Assessment of ICT Support Services for Rural Open University of Tanzania (OUT) Students” in partial fulfillment of the requirements for the degree of Master of Education in Open and Distance Learning of the Open University of Tanzania.

……………………………………….

Prof. Honoratha M. K. Mushi

(Supervisor)

……………………………….

Date

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# DECLARATION

I, Audiface A. Mwanakulya, do hereby declare that this dissertation is my own original work that has not been presented and will not be presented to any other University for a similar or any other degree award.

........................................................

Signature

…………………………….

Date

# DEDICATION

My research is dedicated to The Open University of Tanzania for being honest and fair as I gradually upgraded my professional career while attending my other responsibilities as well as including being close to my family.

# ACKNOWLEDGEMENTS

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# ABSTRACT

This study was conducted in Rukwa region to assess ICT based support services for rural Open University of Tanzania students. The study specifically focused on exploring the Open University of Tanzania rural students perception on using ICT for their learning and to examine the costs of using ICT for teaching and learning at OUT and ensuring implication. 116 respondents from four districts of Rukwa region were involved in this study. Various data collection methods were employed in gathering both primary and secondary data including questionnaires, interviews and documentary review methods. Quantitative data were analyzed by using Statistical Package for Social Science (SPSS) version 20 and qualitative data was analyzed through content analysis technique. Findings revealed students’perceptions of using ICT based support services in rural areas particularly internet services which helped themdue to geographical location especially travelling costs for their distance learning. Based on the research findings, rural OUT students showed positive perceptions on their ability to use ICT based support services in accessing different materials including mobile phones and computers. The study also concluded that, rural OUT students were facing difficulties on accessing and using ICT based support services that reduced their possibility of taping full potentials of distance learning processes. The study recommended that, the OUT regional centers should extend to district wise to increase efficient to rural OUT students and should introduce induction for ICT course.

Keywords: *Information Communication Technologies, ICT Skills, Rural Location & Distance Education.*

# TABLE OF CONTENTS

CERTIFICATION ii

COPYRIGHT iii

DECLARATION iv

DEDICATION v

ACKNOWLEDGEMENTS vi

ABSTRACT vii

TABLE OF CONTENTS viii

LIST OF TABLES xiii

LIST OF FIGURES xiv

LIST OF FIGURES xiv

LIST OF ABBREVIATIONS xv

LIST OF ABBREVIATIONS xv

CHAPTER ONE 1

1.1 Background of the Study 1

1.2 Statement of the Problem 7

1.3 Objectives of the Study 8

1.3.1 General Objective 8

1.3.2 Specific Objectives 8

1.4 Research Questions 9

1.5 Significance of the Study 9

1.6 Limitations of the Study 10

1.7 Delimitations of the Study 10

1.8 Conceptual Framework 10

1.9 Definition of Terms 12

1.9.1 Information Communication Technologies 12

1.9.2 ICT Skills 12

1.9.3 ICT Based Support Services 12

1.9.4 Rural Location 12

1.9.5 Distance Education 12

1.10 Organization of the Study 13

CHAPTER TWO 14

LITERATURE REVIEW 14

2.1 Introduction 14

2.2 Overview of Information Communication Technologies 14

2.3 Information Communication Technologies in Education 15

2.4 ICT Use in Distance Education 17

2.5 ICT at the Open University of Tanzania 18

2.6 Challenges of Using ICT Distance Education 19

2.6.1 Electrical Power 19

2.6.2 Internet Connectivity 20

2.6.3 Training and Professional Development 20

2.6.4 Value Teachers 22

2.6.5 Sustainability of Technology 23

2.7 Perceptions of Students on ICTs 24

2.8 Support Services for Distance Learners 27

2.9 Research Gap 28

2.10 Theory Guiding the Study 29

2.10.1 Constructivism learning Theory 29

CHAPTER THREE 31

RESEARCH METHODOLOGY 31

3.1 Introduction 31

3.2 Research Approach 31

3.3 Research Design 32

3.4 Area of the Study 33

3.5 Target Population 34

3.6 Sample Size 34

3.7 Sampling Techniques 35

3.8 Instruments for Data Collection 36

3.8.1 Questionnaires 37

3.8.2 Interviews 37

3.8.3 Documentary Reviews 38

3.9 Data Analysis and Presentation 39

3.10 Validity and Reliability 39

3.11 Trustworthiness of the Data 40

3.12 Ethical Consideration 40

CHAPTER FOUR 42

PRESENTATION, ANALYSIS AND DISCUSSION 42

4.1 Introduction 42

4.2 Respondents’ Demographic Characteristics 42

4.2.1 Age of the Respondents 42

4.2.2 Respondents’ Gender 43

4.2.3 Respondents’ Education Levels 44

4.3 The Open University of Tanzania’s Rural Students’ Perception of Using ICT for Their Learning 45

4.3.1 Perceptions on the Internet Access 47

4.3.2 Students’ Perception of Using ICT Based on Geographical Location 49

4.3.3 OUT Students’ Perceptions on the Provision of ICT – Based Education Support Services in Rural Areas 50

4.3.4 Perception of ICT Policy and its Impact on ICT – Based Education Support Services to Rural OUT Students 52

4.3.5 Number of OUT Students Pursuing University Studies at Rural Areas 54

4.4 The Cost of Using ICT as Support Service for Teaching and Learning at the Open University of Tanzania 57

4.4.1 The Costs of Using ICT for Teaching and Learning Activities Incurred by the Students 57

4.4.2 The Costs of Using ICT for Teaching and Learning Activities Incurred by the OUT Management Authority 60

4.5 Availability of ICT Support Services for OUT’s Rural Students 63

4.5.1 Availability of Mobile and Telephone Networks 63

4.5.2 Availability of Student Academic Register Information System 64

4.5.3 Availability and Accessibility of Internet Services 65

4.5.4 Availability of Online Library Services 66

4.5.5 Means of Communication between OUT Students in Rural Areas and OUT Management Authority 67

4.6 The OUT’s Mastery of ICT Skills for Use in Learning at Higher Education 68

4.6.1 Ability to Use Computer and Computer Programmes 69

4.6.2 Learners’ Ability to Access Email Services 71

4.6.3 Ability to Access MOODLE and SARIS Platforms 72

4.6.4 Ability to Use Mobile Phone in Pursing OUT Study Materials 74

CHAPTER FIVE 75

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 75

5.1 Introduction 75

5.2 Summary of the Study 75

5.3 Summary of Key Research Findings 77

5.4 Conclusion 78

5.5 Recommendations 79

5.5.1 Recommendations for Action 79

5.5.2 Recommendations for Further Study 80

REFERENCES 81

APPENDECES 90

# LIST OF TABLES

Table 3.1: Research Sample 35

[Table 4.1: Respondents’ Age Groups 42](#_Toc40707800)

[Table 4.2: Respondents’ Gender 43](#_Toc40707801)

[Table 4.3: Availability of ICT Support Services 63](#_Toc40707802)

[Table 4.4: Showing Ability to Use Computer/Computer Programmes 71](#_Toc40707803)

[Table 4.5: The Available ICT Systems in OUT 73](#_Toc40707804)

# LIST OF FIGURES

Figure 1.1: The Conceptual Framework 11

[Figure 4.1: Respondents’ Education Level 44](#_Toc40707742)

[Figure 4.2: OUT’s Rural Students’ Perception of Using ICT for their Learning 46](#_Toc40707743)

[Figure 4.3: Showing the Percentage of the OUT Mastery of ICT Skills for Use in Learning 69](#_Toc40707744)

[Figure 4.4: Means of Communication in Relation to ICT Skills 72](#_Toc40707745)

# LIST OF ABBREVIATIONS

OUT Open University of Tanzania

ICT Information and Communication Technology

EMIS Educational Management Information System

SARIS Student Academic Registration Information System

DE Distance Education

# CHAPTER ONE

**INTRODUCTION**

**1.1 Background to the problem of the Study**

This Chapter introduces the study on assessment of ICT based support services for rural students at the Open University of Tanzania in Rukwa region. It consists of several sections including introduction of the study, background to the problem, statement of the problem and general objective of the study. It further comprises the specific objectives of the study, research questions, and the scope of the study, the significance of the study, conceptual framework, and definition of the key terms, limitation of the study and organization of the work.

Advancements in technology have made it possible for ICT to contribute significantly to distance higher education around the world (Moore & Anderson, 2003). These developments provide access and make it possible for students, mentors and course tutors to interact concurrently and asynchronously (Bates, 2005). The ICT is a breakthrough in distance education; tutors and institutions in which are capable of providing support to their students (Moore & Anderson, 2003). The ICT based service is enhanced through online discussion forums, tele-interaction and email communications. For example, in accessing distance education, students have access to computers and boundless internet facilities within their homes and at distance universities (Owens, et al., 2009).

In addition, ICT development enables students to plan their time and interact with others or with their institutions based on their pace and space (Macintyre & Macdonald, 2011). As noted by Tripathi (2014); there are seven principal characteristics of distance education; including separation of teacher and student, the influence of the educational organization, use of technical media, provision of two-way communication, an absence of group learning, and participation in the form of education in which distance learning becomes a challenge for a student in the rural community if there is little ICT services based.

Flexibility imposed by ICT has enabled teachers to respond to students’ needs and provide immediate feedback on course assignments (Bates, 2005). Moreover, technology has empowered students across the world in engaging online discussions, sharing experiences, supporting each other in learning processes and even forming social forums (Macintyre & Macdonald, 2011). Tait, (2003) argued that ICT services based providing support services to students’ serves cognitive, affective, and systematic functions to guide the its uses in teaching and learning activities to create learning environments that are friendly to user in order to adopt teaching strategies that develop problem-solving skills, and provide access to educational information and administrative support.

ICT as a tool for learning has the power to transform educational pedagogies by empowering teachers with based interaction skills, assessment skills and procedures, and the ability to utilize modern ways of teaching in distance education (Robinson, 2008). Mobile learning, internet services and computer programmes can all be used to reach students however in Tanzania have yet to reap maximum advantages of ICT due to several limitations include ICT poor infrastructure (Tripathi, 2014). The implementation of advanced ICT services helps to promote rural economy and provided basic education. According to Rabbi and Arefin, (2006) claim that, wireless networking will provide e-learning for rural people to facilitate various educational services, through ICT. Web-based learning, has enabled and enhanced visual classrooms, and digital collaboration, which in the past have are been hard to obtain in underdeveloped areas (Tait, 2003).

Robinson, (2008) noted that a distance education expert involved in the EU-China Gansu Basic Education Project, emphasizes the significant role that advanced ICT played in teachers’ training through Teachers’ Learning Resource Centers, of which could connect to the internet. In some places, the areas are isolated, mountainous, and impoverished provinces particular in rural areas where local communities benefited tremendously from ICT projects that are carried out to diffuse Internet technology (Banerjee, 2006).

In developed countries like China have largest Internet population with 103 million users in support of DEPRS which is the largest ICT project that including rural areas (Zhao, et al. 2006). In rural areas there are poor people that may not have the technology or the knowledge and skills required for online learning (Wei, 1999). The importance of radio and television for rural areas seems clear as the major distance education deliver medium, which is the one-way broadcasting and costs much less, besides the costs for the computer networking systems is fairly high and limited (Wei, 1999). However, as CERNET (the Chinese Education and Research Net) and other computer networking technologies develop, distance education is developing with a trend towards multimedia and interactivity (Zhao, et al., 2006).

In Philippine there are high schools located distantly from town Manila which are schools in rural areas. People in the rural areas are able to access to the internet only at the Municipality hall in town, where there are 10 computers in the high school laboratory which is connected to Internet (Yamamoto & Morioka, 2016). According to the school curriculum, the ICT class is still in planning stages, and few staff uses the computes for their daily performance. Up to now, the computers have not been used effectively by school students and teachers (Yamamoto & Morioka, 2016).

In developing countries, the high costs of technology, lack of access to equipment, poor infrastructure, lack of skilled human resources, and lack of policies and inadequate access to Internet services all hinder effective application of ICT in distance education (Wright et al, 2008; Komba, 2009; IFAD; 2010). Without electricity, modern technology obviously cannot be used. Wright et al (2009) found that many people in the developing world lack electricity and are still using candles and kerosene lamps for learning.

Many people in the developing world also cannot afford and do not have access to personal computers, Internet service, or learner-friendly mobile phone (Kumar et al, 2011). This lack of connectedness between students and teachers, and between students and the larger world, may cause feelings of isolation and remoteness and lead to a lack of socialization among students (Dzakaria, 2008). Additionally, the dependence on print media and written feedback leads to delays and miscommunication between students and their tutors. ICT can help offset these issues. Studies have shown that the use of mobile services, emails, and SMS in learning programmes in developing countries supports students learning wherever they are located (Kumar et al, 2011). For example, the Open University of Malaysia uses SMS for counseling services, information giving and learner development support (Lim et al, 2011).

In developing countries like Zimbabwe in the rural communities have lower incomes and compounded by the geographical distance, Lack of funding, heavy workloads, tight budgets, and transportation are the challenges that affects rural students communities in accessing education which cause students to have little opportunity to attend tutorial lessons (McQuaide, 2009). However, it seems to be dominated by traditional media like print, radio, and television (Aderinoye, et al. 2009).

Studies in Tanzania reveal that urban students have more access to ICT and other forms of support services than those in rural areas (Mcharazo & Oden, 2000; Bhalalusesa, 2001; Msuya & Maro, 2002). One could associate this state of affairs with availability of learning resources and Internet services in towns/urban centres. Internet providers are generally more urban and town based for more customers with sustainable income and energy (fairly stable electricity). Although governmental policy in Tanzania seems to favour the practice of distance online education as the government emphasizes the need for universal access to ICT services in the country, to date the resources available are not enough to implement the proposed policies (URT: 2003). This is supported by UNESCO-UIL (2014) who portrayed that rural, remote and nomadic regions are frequently neglected when developing national infrastructure, yet they would be well served by innovative ICT solutions such as radio broadcasts, especially ones which are interactive in nature.

Teaching and learning at the Open University of Tanzania are crucial components which require a comprehensive framework to guide the learning process. Some of these components include, the programmes offered, how they are delivered, students enrolled, the teaching and learning materials used, assessment, available library facilities, use of ICT, complementarities of research and teaching and consultancy facilities among others (OUT, 2017).

In all programmes offered at the university, the ICT infrastructure and services continues to play a crucial role in supporting modern open and online learning. From 2016/17 academic year the university decided to use blended mode of delivery in all programmes. Blended Learning which constitutes combination of online learning and face to face has been preferred because it provides an effective combination of different modes of delivery, models of teaching and styles of learning which are exercised in an interactively meaningful learning environment. Blended learning combines online and classroom learning activities and uses resources in an optimal way in order to improve student learning outcomes and to address important institutional issues (OUT, 2017).

Blended learning is not yet familiar to many students and teachers as well; hence they face three major challenges which include technical, organizational and instructional design. While the technical challenges include resistance to directives on using technology among some members of academic staff, organizational challenges include, overcoming the idea that blended learning is not as effective as traditional classroom training; redefining the role of the facilitator and managing and monitoring participant progress.

The other challenge is instructional design challenges which also include: looking at how to teach, not just what to teach, matching the best delivery medium to the performance objectives; ensuring that online offers interactive rather than static learning. Because of that there is a need of hiring more instructional designers to each faculty to assist the instructors and students. The present system of asking to come for help when the need arise may not be effective. Thus why the study assesses ICT based support for rural students of the Open University of Tanzania

## 1.3 Statement of the Problem

Studies in Tanzania reveal that urban students have more access to ICT and other forms of support services than those in rural areas (Mcharazo &Oden, 2000; Bhalalusesa, 2001; Msuya & Maro, 2002). One could associate this state of affairs with availability of learning resources and Internet services in the towns/urban centres. Internet providers are generally more urban and town based for more customers with sustainable income and energy (fairly stable electricity). Although governmental policy in Tanzania seems to favour the practice of distance education as it emphasizes the need for universal access to ICT services in the country, to date the resources available are not enough to implement the proposed policies. What ICT based support services are there to assist rural students who have no electricity, internet to enable them learn via ICT.

From 2016/17 academic year the Open University of Tanzania decided to use blended mode of delivery in all programmes. Blended Learning was preferred because it provides an effective combination of different modes of delivery, models of teaching and styles of learning which are exercised in an interactively meaningful learning environment. Blended learning combines online and classroom learning activities and uses resources in an optimal way in order to improve student learning outcomes and to address important institutional issues (OUT, 2017).

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## 1.4 Objectives of the Study

### 1.4.1 General Objective

The main objective of this study was to assess ICT based support services for rural students at the Open University of Tanzania in Rukwa region.

### 1.4.2 Specific Objectives

In this study, four specific objectives have been coined namely:

1. To explore the Open University of Tanzania’s rural students’ perception of using ICT for their learning;
2. To examine the costs of using ICT for teaching and learning at the Open University of Tanzania and ensuing implications;
3. To assess the availability of ICT based support services for rural students at the Open University of Tanzania.
4. Assess mastery of ICT skills for use in learning at higher education, specifically at the OUT.

## 1.5 Research Questions

The following research questions guided the research process:

1. What are the OUT rural students’ perceptions of using ICT for their learning?
2. What are the costs incurred by rural OUT students when using ICT for learning?
3. What are available ICT based support services for rural students who study at the Open University of Tanzania?
4. What do rural based OUT students consider to be their mastery levels of using ICT for learning?

## 1.6 Significance of the Study

This study play significant roles on ICT based support services for rural students at the Open University of Tanzania through the following ways: The study is useful to OUT student where it may contribute to informing OUT authority to design intervention programmes for rural students on how best to engage and benefit from using ICT for learning. It is also act as motivation for OUT students to understand their challenges, level of skill they posse towards ICT and the way forward to overcome those challenges in supporting their teaching and learning activities.

The study is further significant to other educational stakeholders since it act as reminder to educational stakeholders to revise policies and priorities concerning ICT facilities improvement on the quality of information provision and infrastructure at OUT, specifically for rural students. Furthermore, the study is crucial to OUT authority since act as a marketing and promotional tool for OUT activities including the role of ICTs in teaching, learning and information provision. Finally, the study is useful to prospective students who expected to undertake research works through contribute to the body of knowledge on issues related to ICT for use in distance education in rural areas in Tanzania.

## 1.7 Limitations of the Study

The Open University of Tanzania has its centres in all the Regions in Tanzania mainland and Zanzibar. The research is intended to cover the whole population area which could require the researcher to spend a lot of time and financial resources to cover the area population. In view of this the researcher confined the study to Rukwa region due to limited time and financial resources, and the fact that Rukwa represents a good number of rural OUT students who participated as respondents for this study. In overcoming this, the researcher finds out the OUT regional coordinator to establish the exact number of OUT students at the region.

## 1.8 Delimitations of the Study

The great part of this research covered ICT support services of rural students at the Open University of Tanzania‘s Rukwa Regional office. This study solely focused on only four districts which were highly dominated and characterized by rural environment include Namanyere, Nkasi, Kalambo and Sumbawanga rural.

## 1.9 Conceptual Framework

In the conceptual framework of this study, it is conceptualized the way ICT based services influence teaching and learning process in OUT students of rural areas. The ICT based services includes laptops/desktops, availability of network, phone usage and computer programmes are articulated by the OUT rural students on the way to facilitate their teaching and learning activities. This provide the framework on how OUT students in rural areas perceive ICT based services, determine the costs of using them, to identify the available services located in their rural areas and assess the their skills on how to use them to facilitate their learning activities.

 **ICT based services**

**Teaching and learning activities**

 Laptops/desktops

* Accessing internet
* Accessing online library
* Accessing Web and SARIS
* Accessing Email
* Phone calls

OUT rural students

Availability of network

Phone usage

Computer programmes

#

# Figure 1.1: The Conceptual Framework

Therefore availability of ICT based services includes laptops/desktops, availability of network, phone usage and computer programmes to OUT students in rural areas based on their perceptions, estimate cost of using them, the magnitude of available services and mastery of skills determine effectiveness of teaching and learning activities among OUT students in rural areas through Accessing internet, accessing online library, accessing Web and SARIS, accessing email and phone calls. This is illustrated in the diagram below:

# 1.10 Definition of Terms

### 1.10.1 Information Communication Technologies

Information Communication Technologies **(ICT) refers to all equipment, applications and services that involve communication.** Computers, cell-phones, televisions, radios and satellite systems are all part of ICT.

### 1.10.2 ICT Skills

This refers to all skills one needs in order to access and perform all works using the computer or other information communication devices that enable processing data for a variety of tasks and activities.

### 1.10.3 ICT Based Support Services

Involves all assistance students require in relation to ICT usage along their leaning processes.

### 1.10.4 Rural Location

Is a geographic area that is located outside towns and cities (countryside) which is characterized by low population density and small and scattered settlements, agricultural area?

### 1.10.5 Distance Education

Is an organized educational experience in which teaching and learning take place in a distant way through accessing online materials, instructions, communication using ICT based services between students and the instructors.

## 1.11 Organization of the Study

The present study comprises five chapters, where chapter one is made up of various sections including, the introduction, background of the problem, statement of the problem, general objective, objectives of the problem, questions and scope of the study. It further comprises the limitations of the study, significance of the study, conceptual framework, definition of the terms, and organization of the work. Chapter two of this study comprises a literatures review which consists of sections such as introduction, theories that guide the study, empirical study and research gap. Chapter three of this dissertation comprises of introduction, study area, research approaches, research design, study population and sample size. It also comprises sections on sampling techniques, instrument for data collection, data analysis, reliability and validity, trustworthiness and ethical consideration. In chapter four the study constitutes of analysis and interpretation of the findings. Lastly chapter five consists of summary, discussions, conclusions and recommendations of the study.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter presents the literature review related to the study. It aims at giving a direction and a good understanding of the key issues under study. The chapter discusses the concept of Information Communication Technologies (ICTs), ICT use in Education, distance education and at the Open University of Tanzania. Challenges of using ICT in distance education, Perception of students on using ICTs, support services for distance learners and the research gap.

## 2.2 Overview of Information Communication Technologies

Information Communication Technologies (ICTs) are defined as electronic technologies for collecting, storing, retrieving, processing, and communicating information. They can be separated into two main categories. The first category is those which process information such as computer systems. The second category includes those which disseminate information such as telecommunications systems (Gunton, 1993) ICTs may as well be described as the range of technologies for gathering, storing, retrieving, processing, analyzing, transmitting and sharing information (Maro, 2008).

Furthermore, Hameed (2006) gives another definition of ICT as a broad subject concerned with technology and other aspects of managing and processing information and which deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and retrieve information. Some of the technologies considered as ICTs are; Radio and Television (broadcasting technology), telephone, computers, mobile technologies and the internet.

#

## 2.3 Information Communication Technologies in Education

In the past educational institutions provided little choice for students in terms of the method and manner in which programs were delivered. Students were typically forced to accept what was delivered and institutions tended to be quite static and traditional in terms of the delivery of their programs. At present, the use of ICTs provide many options and choices and many institutions are now creating competitive edges for themselves through the choices they are offering students. These choices extend from when students can choose to learn to where they teach (Oliver, 2002). Also, the emerging ICTs are contributing significantly to the content of education curricula and the ways in which they are dominating so much of contemporary life and work (McCausland et al., 1999).

As computers and the internet continue to transform the economy and society, the role of information communication technologies (ICTs) in fostering development has become more generally recognized. If one was to compare such fields as medicine, tourism, travel, business, law, banking, engineering and architecture, the impact of ICTs across As computers and the internet continue to transform the economy and society, the role of information communication technologies (ICTs) in fostering development has become more generally recognized. If one was to compare such fields as medicine, tourism, travel, business, law, banking, engineering and architecture, the impact of ICTs across the past two or three decades has been enormous (Oliver, 2002). Information and Communication Technologies (ICTs) are forces that have changed many aspects of the way we live.

As a result, Judy and Angela (2008) observe that over the last two decades there have been fundamental shifts in the way teaching and learning are perceived and conducted within the tertiary education sector. One is a move from teacher-centred to student centred education. The other is a move from the traditional to the virtual classroom. Information Communication Technologies (ICTs) in most cases have most essentially had tremendous success in providing services at reduced costs to the people’s door steps and for making higher education available to all classes of people. As a result, on one hand people, will have the access right on higher education and on the other hand will gain the necessary knowledge, skills and experiences to serve the nation and prosper accordingly (Blurton, 2002).There have been rapid changes in education sector because of ICTs.

Different ICTs are now set to become instrumental to help expand access to education, strengthen the relevance of education to the increasingly digital workplace and raise educational quality by among others, helping make teaching and learning into an engaging activity (Shah and Shafiul, 2010). These further indicate that the application and exposure to and deployment of ICT fundamentally change the way education is conceived and delivered to students. Due to its easy accessibility, this means of education has become very popular all over the world. Thus, distance education has got a thrust after the evolution of ICT-based education system.

There is no doubt that Information and Communication Technology (ICT) holds the promise of transforming the ways we live into new and more powerful ways. ICT has become a strategic resource, a commodity and foundation of every activity from technology, communication, health to entertainment. ICT now plays a major role in distance learning and research in general (Ajayi, 2003).

## 2.4 ICT Use in Distance Education

If used effective ICT can transform learning environment into one that is learner-centered. When used appropriately, ICTs especially computers and Internet technologies enable new ways of teaching and learning (Nihuka, 2011). These new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from a teacher-centered to learner-centered pedagogy (Tinio, 2003).

In conjunction with this statement (Hahn, 2012) argue that, “a good quality pencil cannot improve a student’s learning, but it can, however, help that student write easily and comfortably. Similarly, ICT does not guarantee that a student will learn, but it can help student find information quickly and easily.” Various techniques that stimulate learning using ICT in DE therefore require necessary attention by educators for effective learning. Teleconferencing in DE can be useful ICT tool in DE to reach remote learners. Teleconferencing refers to “interactive electronic communication among people located at two or more different places.” There are four types of teleconferencing based on the nature and extent of interactivity and the sophistication of the technology**:**

1. audio conferencing;
2. audio-graphic conferencing,
3. videoconferencing; and
4. Web-based conferencing.

In open and distance learning, teleconferencing is a useful tool for providing direct/synchronous instruction and learner support and minimizing learner isolation (Tinio, 2003). According to Tinio (2003), some higher learning institutions that were using teleconferencing in their online programmes by the year 2003 includes Tianjin Medical University in China, Open University of the United Kingdom, UNITAR (Universiti Tun Abdul Ruzak) in Malaysia, Open University of Hong Kong and Indira Gandhi National Open University.

## 2.5 ICT at the Open University of Tanzania

Information and Communication Technology (ICT) is provided to support teaching, learning, research and administrative activities of the Open University of Tanzania (OUT). Therefore, the University encourages the use of electronic communications to share information and knowledge in support of the University's mission and to conduct majority of the University's business. To this end, the university supports and provides interactive electronic communications services and facilities such as telephones, teleconferencing, electronic mail, social networking, publishing services and internet services (OUT, 2017).

The university requires effective information and communication technologies (ICT) to enhance smooth functioning of the institution. An integrated policy cannot anticipate all the new issues that might arise in the course of developing, using and managing ICT. One purpose of this policy is to provide a framework within which issues arising from ICTs can be recognized and resolved institutional-wise (OUT, 2014).

ICT has been used as a major medium of education delivery to support teaching and learning at the Open University of Tanzania. An e-learning platform has already been put in place. Lecturers have been capacitated with skills to develop and upload their courses unto the e-learning platform. Moreover, students have also been trained how to access their courses and interact with lecturers. However the number of courses uploaded is not substantial and few have integrated multimedia. OUT shall continue to emphasize on the usage of e‐learning, other blended learning approaches and integration of multimedia. In the OUT policy document that the researcher reviewed teaching and learning at the institution include instructional design and course content delivery, students assessment in form of a portfolio and examination. At OUT, ICT is core to the realization of innovative teaching and learning that is supported by these three aspects (OUT, 2014).

## 2.6 Barriers of Using ICT in Distance Education

There are various challenges of using ICT in distance education. Wright (2014) listed five such challenges which are elaborated under the sections presented under items 2.6.1 through 2.6.5.

### 2.6.1Electrical Power

It is a fact that one you need power to run technological devices and until power is widely available, reliable, and affordable for many in Tanzania and elsewhere, educational technology uptake will continue to be slow.  About 70% of those living in sub-Saharan Africa do not have easy access to electrical power. Even if people could not afford to purchase various electronic gadgets, access to power as noted above, would improve their lives because they would be able to read after dark and would be healthier as they would not be exposed to fumes caused by burning fossil fuels and plant matter made major investments in Africa and Southeast Asia, perhaps along with its extensive mining and road building projects it will add power-generation to its list of initiatives.

On June 30, 2013, in Cape Town, President Obama announced [Power Africa](http://www.usaid.gov/powerafrica) an initiative to double the number of people who will be able to access electricity on that continent. Initially, the project will focus on increasing electrical capacity in Ethiopia, Ghana, Kenya, Liberia, Nigeria, and Tanzania. That is a good start, but what about the rest of Africa?

### 2.6.2 Internet Connectivity

The challenge for all countries in the developing world is delivering the last “mile” of connectivity to homes for a reasonable cost. In addition, the bandwidth must be capable of carrying compressed videos so that citizens can have access to the wide variety of educational materials available in a video format and be able to exchange reasonable quality photographs and video clips. Increased Internet accessibility and increased bandwidth are unlikely to occur without commitment by governments and the involvement of private enterprise such as the mobile phone operators. In time perhaps, broadband access to the Internet will be considered a basic human right.

### 2.6.3 Training and Professional Development

Electrical power, Internet bandwidth, and electrical devices may all be present, but teachers and students need to know how to use them effectively. Teachers who have been brought up in a world with limited technology can find it difficult to use technology to engage and support learning. Whatever training and professional development opportunities that are provided to teachers must be long enough for them to grasp the concepts behind teaching with technology, to have hands-on experience using the technology, and to revise or develop one lesson that they can use when they return to their classroom or online environment.

Sessions should be held to help teachers locate, adapt, and translate open educational resources (OERs) for their learners. Based on my experience in countries such as Bangladesh and Sri Lanka, translating materials into the local language and having interpreters present may require additional resources and/or reduce the amount of content that can be given in a specified time. But at the end of the training session, a greater number of participants have increased knowledge and are better able to apply what they have learned. Teachers need quality pre-service training, but they also need on-going training and support from mentors.

Government bodies or funding agencies often talk about the need to foster a quality learning environment, but then provide funding for a large number of people to receive minimal training within a short period of time. Their focus seems to be on quantity not quality. Perhaps, when funds are limited, a more effective approach would be to give solid training to a few and have each commit to provide training to three others and so forth a pyramid approach.

One of the initial failings of much publicized large-scale technological interventions such as the One Laptop per Child (OLPC) Project was the lack of training and support provided to teachers. (Though OLPC may have failed in some ways, the initiative spurred the development of affordable, mini computers for education and the discussion of the criteria to judge the success of educational technology implementation projects). However, it must be recognized that in many developing countries there is a shortage of qualified teachers; thus, efforts are placed on quantity not quality.

Perhaps massive open online courses (MOOCs) are the answer, but not in the form that is prevalent today as current MOOCs tend to appeal to people who are already well-educated and have access to adequate Internet bandwidth to view well-crafted videos. For those in developing countries, MOOCs may need to be more localized, more practical, and require less bandwidth than those offered elsewhere.The videos may need to be shorter or consist of several self-contained but inter-related segments. The MOOCs may also need to be part of a blended learning environment that fosters the development of local learning communities so that learners can obtain the face-to-face contact that is part of their rich-cultural heritage.

### 2.6.4 Value Teachers

Teachers should be valued more, yet in many places they are not. Being paid a proper living wage relative to others in an area is part of it, but the other is respect for the profession. People cannot focus on teaching if they must hold several part-time jobs in order to support themselves and their families. Teachers should be looked upon as cornerstones of the society as upon them rests the responsibility of educating the next generation. Thus, the best minds need to be attracted to teaching. People who genuinely care about helping others need to be attracted to teaching. Yet, some teachers I meet in emerging nations think of teaching as something to do rather than something they want to do. They think of filling heads with content rather that engaging students to solve problems and encouraging them to view the world from different perspectives.

Today, one needs teachers who are willing to try new methods and technology, and willing to fail as they strive to improve themselves. Trying, failing, and succeeding is what learning is all about.

### 2.6.5 Sustainability of Technology

The outcome of any educational technology project in the developing world must have at least two aspects. First, how does the technology or instructional method improve learning and second, how will the technology or method be sustained once initial funding has ended? I personally know a few educational professionals, who get excited by the latest trends – currently, the use of tablets or MOOCs.When I ask them about sustainability, they raise their eyebrows and wonder why I am not focused on the potential merits of a new device or method. Why am I not exciting by the possibilities? I am. But experience has demonstrated over and over that glitzy technology is initially very appealing and accompanied by exaggerated claims of being a “dragon slayer” or a solution to all that ails the educational system; but if it cannot be supported and maintained, it becomes a sophisticated paper weight.

New instructional methods that cannot be sustained frustrate those who spent considerable time to learn them only to find that they can’t maintain them. Resources and time are lost. Developing countries do not have resources to lose or time to waste.

## 2.7 Perceptions of Students on ICTs

The views of students and lecturers about technology are very diverse (Nihuka, 2011). According to Hiltz, Johnson, and Turoff (1991), students are positive in using ICTs when working together online. Hilts et al (1991) found that there is differential use of ICT between the younger and older students. The younger students use Internet more for playing games and chatting, while the older students use it more for e-mail. This gives a clue that the use of ICT for leisure may be due to its earlier incorporation in lives, although the age differences in this population are minimal.

On the other hand, there are no excessive differences in the perception of university students regarding the uses, advantages and difficulties of ICT between students due to their gender or age group. For example, women mention more advantages related to autonomy and learning, such as having access to complementary material and establishing their own study time table (Azcorra, Bernardos, Gallego, & Soto, 2001; Jorge, Acosta, Garcia,& Diaz, 2003). Some women also mention more concerns or difficulties of a technological nature (not knowing how to use the Internet) and of a "communicative" nature (not "seeing" the teacher and classmates). Although many students’ satisfaction surveys have been conducted on the use of ICTs, it is still unclear whether or not students fully perceive the potential of ICTs and use them effectively (Noss & Pachler, 1999).

Galanouli, Murphy, & Gardner, (2001) reported that students perceive three main barriers to their perceptions of ICT use during learning practice: teachers’ attitudes, lack of resources and lack of time. Although lack of appropriate equipment was considered an important factor when students were unable to use ICT in their learning, it was also clear that teachers’ uptake of ICTs and attitudes towards ICTs’ use played the most crucial role in the success or failure of their teaching and learning. This concurred with Lee, (2002) who found that student perspective on using computers and their attitude played an important role for determining the success of its use.

In a study to examine students’ perceptions of ICT integration by faculty at a Midwest public university, Keengwe (2007) reported that students lack computer skills in various computer applications that are necessary to support and enhance their learning experiences. This implies that college students do not necessarily possess the much needed skills to conform to the process of ICT integration, but could benefit from direct technology-specific instruction by their faculty.Almost all rural communities in the world have a problem with technology facilities and have not been able to obtain any benefit from the advantages of using ICT (Hasan et al., 2007). Malaysia has introduced various programs to provide internet access in rural areas. Althoughthe rural community has begun to receive ICT technology development, problems or factors that influence the development of ICT in this area are still difficult to overcome completely. According to Zulkhairi, Azizah, Abdul Razak, and Rafidah (2010).

Hosseini, Niknami, and Chizari (2009)reported that there are several challenges faced by rural communities in using ICT such as organizational, technical, financial, and social. For organizational aspects, the factors identified were lack of interest and expertise in using ICT, concerns about the risks of using ICT, low quality of the services provided by the service centre, and the lack of interest by the private sector to participate in the development of ICT for rural areas. Based on the technical aspects, the use of low-bandwidth, hardware shortages, lack of appropriate infrastructure, lack of software and telecommunications

According to Walsham and Sahay (2007), in developing countries, the use of ICT helps in the development and growth of a national economy. With the rapid development of ICT in development, countries globally have taken the opportunity to apply technology in raising the living standards of their people. The rapid changes in ICT products have influenced the development of technology used in the educational field (Li, 2016). Ghavifekr and Ibrahim (2015) stated that the integration of ICT in Malaysian classrooms needs serious consideration in order to increase the competency of those enrolled in the country's education system.

The development of ICT has changed the teaching and learning process from traditional methods to a technology based approach. Since the advent of internet technology, there has been a change in the pattern of life of communities and society around the world in education, economics, politics, and socially. AlJeraisy, Mohammad, Fayyoumi, and Alrashideh (2015) stated that sharing and collaborating with regard to information can be equally extended to the teaching and learning process. According to Nuurrianti (2016), this is because the use of the internet continues to grow from time to time.

Kop (2011) also explained that contributions in educational technology are in terms of the dissemination of learning content without borders and students are able surf the Internet which helps to enhance their understanding of a subject or topic being taught. Development of information technology and communication has greatly influenced the integration on using technology, particularly in the teaching and learning process. In 2012, the Malaysian Education Development Plan 2013e2025 placed emphasis on the use of information and communication technology in the field of education and 1BestariNet was introduced in all government schools (Ministry of Education, 2016). Correspondingly, the creation of the Smart School initiative in 1999 was a move that expected to provide a widespread application of computer technology in the educational system. The move was expected to bridge the digital divide between all communities.

## 2.8 Support Services for Distance Learners

The learners’ support services include all activities beyond the production and the delivery of course materials that assist in the progress of students in their studies (Simpson, 2000). These can be in the form of facilities, administrative assistance, supplementary reading materials and references, human interaction, advice and moral support. Krishnan (2012) viewed learner support services as being inclusive of facilities and activities that are provided to make the learning process easier and more interesting to the learner. Garrison and Baynton (1987) describe support services as services that include all the resources that enable students to learn effectively Students support services includes academic support-skills which focus on reading skills, writing skills, feedback.

None academic support- information, recording, admission, funding, facilitating application, counseling. For example counseling, financial difficulties, family problems, difficulty in maintaining motivation, problems in finding sufficient time to study, balancing conflicting commitments; and physical difficulties or barriers, including limited mobility, hearing or sight impairment.

## 2.9 Research Gap

Conventional systems and delivery of education in Tanzania have proven inadequate in developing a well-educated population and progressive socioeconomic environment. The provision of education at the university level can be a staging ground for creating the human capital that will drive the country’s social and economic development. The Open University of Tanzania is pushing this movement forward by widening access to higher education to the majority of the people who live in rural and urban areas. Meeting their educational needs requires a well-established mechanism for delivering education within this context. ICT based support service could prove to enhance students’ effective learning.

However, in order to provide appropriate ICT for the students, we must explore and identify the types of \facilities that are available and accessible within these areas. Little research has been conducted on learning and ICT-based support services for rural distance students at the university level. Most of the literature on remote populations examines developed countries like the UK, USA and Australia (Owens et al, 2009; Glomb et al, 2009; Macintyre and Macdonald, 2010). Even in those studies, the gap between rural and urban provision is enormous, as exemplified by varying policies, levels of development, programmes offered, and context. Hence it is imperative to conduct relevant studies in rural contexts in less developed countries like Tanzania.

## 2.10 Theory Guiding the Study

### In education there are various theories of learning explored which are Cognitive learning theory, Humanism learning theory, Behaviorism learning theory, Constructivism learning theory, and Connectivism learning theory (Western Governers University, 2020). But the theory which guides the study is constructivism theory. It is significant for this study due to its connection on student centered learning system.

### 2.10.1 Constructivism learning theory

###  Suhend, (2018) noted that student autonomy is concerned in constructivism’…” In applying constructivism theory, students can make additional knowledge such as writing poet, short drama, scenarios… because it opens the learners’ curiosity. Constructivism learning theory underpins student-centered teaching methods and techniques which contrast with traditional educational, whereby knowledge is simply passively transmitted by teachers to students (Mcleod, 2019). It is also noted that, learning is achieved when an individual is able to form associations between a particular stimulus and response.

Apart from the autonomy of the learner, (Moore1993a) explored issues beyond the physical separation of the learner and teacher. He was one of the early scholars on distance education who attempted to define distance education from a transactional or process point of view. Transactional distance refers to the communication and psychological gap between the learner and the teacher (Moore 1993a). It is not determined by physical distance but by the relationship between the amount of dialogue between the learner and the teacher and the amount of structure in the design of the instruction (Moore 1993).

Transactional distance exists in all forms of education but is greater where there is less dialogue between the teacher and the student. Instructional dialogue happens when either the teacher or the student gives instruction(s) and the other response. Transactional distance is reduced by fast, frequent and spontaneous dialogue and interaction between the teacher and the student. Moore places greater emphasis on the nature of the mode of communication since interaction between the teacher and the learner affects the quality and quantity of dialogue (Moore 1993a). With the appropriate use of modes of communication, it is possible to “increase dialogue between learners and their teachers, and thus reduce the transactional distance” (Moore 1993).

ICT-based distance education courses, for example, allow for more intensive, personal, individual and dynamic dialogue, and thus reduce transactional distance (Moore 1993a). ICT based modes of communication, therefore, have the capacity to narrow transactional distance and enable faster dialogue and interaction between the learner and the teacher. Transactional distance is an important issue, which involves teacher-content, teacher-student and student content educational relationships.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter discusses the methodology that was employed to undertake this study. The chapter describes research approach and design of the study. This chapter also presents the study area and the target population of the study. It constitutes the description of the sample size and sampling procedures used in selection representative sample of this study. This chapter also explains data collection procedures and techniques that were used in collection of both primary data and secondary sources of data. The chapter further describes methods used in analyzing quantitative and qualitative information as well as data presentation. This chapter finally explains validation and trustworthiness of the study and ethical consideration.

## 3.2 Research Approach

This study employed mixed approach that involved gathering of both qualitative and quantitative information. The use of mixed approach allowed the researcher to increase accuracy of the study findings through the use of diverse methods in the same subject of the study as well provided strong evidence for a conclusion through enhancing validation of the findings. It was observed that; the use of mixed approach can take advantage of the collective strengths of quantitative and qualitative approaches and use the strengths of one technique to supplement the weaknesses of the other so that the quality and reliability of data collected become optimally maximized. Dornyei (2007) recommended triangulation for the purpose of generation of multiple perspectives on a phenomenon by using a variety of data sources, investigators, theories or research methods with the purpose of corroborating an overall interpretation.

During data collection processes, both quantitative and qualitative data was gathered concurrently to investigate the relationship between different phenomenon relating to the topic under study. Quantitative methods allowed the researcher to gather quantifiable information related to the access and use of ICT based support services in distance learning for rural Open University students in the study area. Qualitative methods to the other hand enabled the researcher to explore perceptions and experiences of the respondents about the topic under study. Therefore, quantitative information was collected through questionnaires while qualitative information was gathered through interviews, observation and from documentary reviews.

## 3.3 Research Design

Research design refers to the outline of what researcher will do from objectives and its implication to the final analysis of the data (Kothari, 2004). The study adopted the concurrent parallel design, which involves simultaneous collection of the qualitative and quantitative data and analyze separately and then combining them during interpretation to use the results to understand the research problem (Creswell, 2011). Quantitative research design is for cases where statistical conclusions to collect actionable insights which are essential (Bhat, 2020).

In using this research design, data were collected by using close ended questionnaires as quantitative data in separate with semi-structured interview. About 65% of respondents argued that ICT support services could help them in their studies as being the distance learners because they were able to communicate with their facilitators, students among themselves. Also they could get study materials by the support of ICT based support services. It was 29% of the respondents who argued that ICT based support services could not assist them effectively due to various barriers they faced for example limited ICT based support services materials like computers and smart phones. But 06% of the respondents were not aware whether ICT based support services are helpful or not. Qualitative research design is a general way of thinking about conducting research in a descriptive or narrative way including phenomenology, ethnography, grouped theory, and case study (Astalia, 2013). The researcher employed qualitative research design on documentary review to get ideas from various literatures as mentioned on chapter two of this document.

Further, the study analyzed data separately in accordance with data collection processes, since qualitative and quantitative data were analyzed and presented using interview with documentary review and questionnaire method respectively. The present study used concurrent research design because of the possibility of sight the premises from one approach to develop or inform the other approach in propounded objectives to establish the results of the study (Creswell, 2012).

## 3.4 Area of the Study

The study was conducted in Rukwa region assessing the ICT base support services for rural OUT students. Since the study focused on rural students, the study also extends to four district of the region including municipal council where the center of OUT office, Kalambo, Nkasi and Namanyele. The region and its confined districts was purposely selected to represent rural environment since most of the geographical areas of the districts in Rukwa region constitutes a remote rural environment characterized by poor transport system, poor Internet connectivity, and lack of sustained electricity supply.

## 3.5 Target Population

A target population is a group of individuals or organizations with some common defining characteristics that the researcher can identify and study (Creswell, 2012). The target population of this study was students of the Open University of Tanzania from all 4 district council of Rukwa region. The study population also comprised of staffs from center of OUT Rukwa regional office (academic staff, administrative staff, technical and support staff). Students are the one who use ICT in their learning processes, OUT staff are the ones who offer various support services to their learners. Internet services providers around the study areas also were consulted during this study since they are aware on challenges facing rural OUT student on accessing and using ICT based support services during their learning processes.

## 3.6 Sample Size

A sample is a subset or small unit which has been selected as a representation of the target population of the study where generalization of the study can be made (Marczyk, et al. 2005). The sample size selection of the study considered population size of The Open University of Tanzania (OUT) at Rukwa region. It was about 200 students studying via OUT at Rukwa region. According to Vasileiou et al(2018) sample sizes of ‘justifying’ and ‘non – justifying’ articles in BMJ and SHI did not differ significantly from each other, and in the BJHP ‘Justifying’ articles mean rank is 31.3 which had significantly larger sample sizes than non-justifying studies mean rank of 22.7.

Since was not possible to cover the whole population of the study due to time and financial limitation during the study, the sample size of this study comprised a total number of 116 respondents. Regardless of such constrains, the use of selected sample enabled the researcher to meet the intended objectives of this study with reduced costs. Therefore, the selected sample size of this study consisted of 100 students pursuing their studies at Open University of Tanzania specifically in Rukwa region, 4 OUT staffs at Rukwa regional office center, 4 internet service providers and 8 Non students who were completed their studies at Open University of Tanzania as Illustrated in Table 1.1.

**Table 3.1: Research Sample**

|  |  |  |
| --- | --- | --- |
| **S.N** | **Category of Respondents** | **Number of Respondents** |
| **1** | Students (Undergraduate and non-degree) | 100 |
| **2** | OUT staff at the Rukwa Regional centre | 04 |
| **3** | Non students completed their studies at OUT | 08 |
| **4** | Internet services provider | 04 |
|  | **Total** | **116** |

## Source: research data, 2020

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## 3.7 Sampling Techniques

This study employed simple random, purposive and convenience sampling techniques in selecting the representative sample from the study population. Simple random sampling technique was used to obtain representative sample of the study from student who were pursuing their studies at Open University of Tanzania in Rukwa region. Statistics of those students undertaking their studies from different districts of Rukwa region was obtained in Rukwa OUT regional center. Names of those students in every district were written on small pieces of and rotated into small box.

Thereafter, the names of respondents were randomly picked from the box to obtain sample of the study for every district and at regional center. The use of simple random sampling technique gave equal probability for every OUT student in the selected study areas to be chosen as a sample of the study. Purposive sampling technique to the other hand allowed the researcher to choose sample of the study by considering individual knowledge, experiences and awareness on the phenomenon under study. It was argued that, through purposive sampling the researcher can be able to select respondents basing on his or her own judgment who can yield relevant and plentiful data related to the studied topic (Baxter & Babbie 2004).

Therefore, purposive sampling technique was employed in selecting respondents from OUT staffs and internet service providers. Convenience sampling also was employed to obtain respondents who will happen to be around during the study and they can provide in-depth and rich information about the study. This technique was used to obtain students who were completed their studies at Open University of Tanzania to tap their experience and understanding on the use and access of ICT based support services in relation to rural students who pursuing their studies in OUT through distance learning.

## 3.8 Instruments for Data Collection

Various data collection instruments were used to collect data for the present study includes Interviews, documentary reviews and questionnaires as explained below:

### 3.8.1 Questionnaires

Questionnaire is an instrument for collecting survey information, providing structured, numerical data, being able to be administered with or without the presence of the researcher on prepared schedules, and often being comparatively straightforward to be analyzed (Cohen, et al, 2007). This study used questionnaires to collect information related to the mastery of using ICT based services and available ICT services to OUT students in rural areas. During the data collection the researcher distributed questionnaires to selected respondents.

The questionnaires were used in the study because helped to obtain information quickly and easily from the respondents since they need to fill them and return in a very short period. According Dawson (2007) argue that, through the questionnaires the researcher can send questionnaires quickly and simply to the respondents and receive responses back within shorter. Also the study used questionnaire for comparing variables. As noted by Cohen, Manion and Morrison (2007) that, the questionnaires are useful comparatively straightforward to analyses and interpret data. This method was administered to OUT students in rural areas.

### 3.8.2 Interview

Interview is face to face interaction between interviewer and interviewee to elicit information, beliefs or opinion with specific purpose in the topic under study (Kumar, 2011). This study employed semi-structured guiding questions which were administered to OUT staffs, district internet service providers and some students in rural areas. The interview was used in order to get information about the OUT students’ perceptions in rural areas about ICT based services, availability of ICT based services in rural areas and mastery skills of using ICT based services. The method allowed the researcher to conduct in-depth discussions with respondents and probe more questions about the topic under study and emanated high interactive sessions.

During data collection, the researcher took an audio record under the consent of participant and takes notes during interview process. Languages used were English and Kiswahili language depends on the preference of the participant. The rationale for using this method was to acquire in-depth information (Kumar, 2011). It further help to gain insights into things like people’s opinions, feelings, emotions, experiences and sensitive issues in open and honest manner (Denscombe, 2007).Triangulation of data collection methods during the study minimized the weakness of other instruments since the use of various methods reduced the bias raised during the use of interview method.

### 3.8.3 Documentary Review

Documentary review is a systematic enquiry of written documents and other written materials that describes the past and current state of information on the topic of your research study by obtaining permission to access those information and then taking notes or recording particular information (Creswell, 2012). This study used various documents with different reports concerning different minutes which advocate various document materials which show costs of using ICT, electrical charges and internet service charges. Also the study explored various documents concerning number of OUT students who are currently undertaking their studies in rural areas.

The researcher opted to use this tool because it enables a researcher to reach inaccessible persons or subjects in the case in form of records (Cohen, et al., 2007). It’s also providing useful skill that can be applied to speed up the data collection for research work through wide coverage of information sought by others (Walliman, 2006). They are also ready for analysis without the necessary transcription that is required (Cresswell, 2011). The disadvantages of documentary are as follows; it is more difficult for the researcher to gain access to the documents, particular to expose them publicly available reports hence become challenge to the researcher when it comes to getting hold of such documents as well as getting permission to use them as research data (Denscombe, 2007). These weaknesses were supplemented by other methods like questionnaires and interviews.

## 3.9 Data Analysis and Presentation

Quantitative data which was obtained through questionnaire survey was interpreted and analyzed based on research objectives. Descriptive statistics was employed in analyzing quantitative information. The data was edited for simple analysis and coded through Microsoft Excel and then analyzed by using Statistical Package for Social Sciences (SPSS) version 20. Frequency and percentages was used to facilitate data interpretation while tables, figures and graphs were used for data presentation. On the other hand, content analysis technique was employed in analyzing qualitative data that was gathered through interviews and documentary reviews.

## 3.10 Validity and Reliability

In the present study, the validity was established where a researcher involved peer review before data collection process to ensure the validity of the research tools used such as questionnaires and interviews. Also the instruments were given to supervisor who passed through for whole process of preparing the instruments includes interview, questionnaires and documentary reviews to see if they were valid or not and gave necessary recommendations for improvement before data collection. To ensure reliability, the pilot study was conducted to few individuals who were purposively selected in Rukwa OUT regional center and were not included in the present study before the actual process of data collection begins. This enabled the researcher to cross check the accuracy of the questions contained in questionnaires and question with errors were corrected to increase its validity.

## 3.11 Trustworthiness of the Data

In insuring trustworthiness of study, the present study involved triangulation through using different instruments such as interviews, questionnaires and documentary reviews to similar issue, after data analysis to see whether they relate or contradict in order to get strong and common findings. In addition, the study involved confirmability, whereby a researcher used the findings of the current study to confirm with other studies.

## 3.12 Ethical Consideration

Ethical consideration refers all procedures that are to be followed in conducting research as well ensuring maximum conformity to standard of conduct research, (Omary, 2011). In this study the researcher took various steps to ensure maximum conformity to standard of conducting research. Firstly, prior to undertaking field work, the researcher obtained research permits from the Open University of Tanzania for data collection. The researcher requested permit from Regional Administrative Secretary (RAS) office to get an access permit to Rukwa region and used such permit to request in four districts to District Administration Secretaries (DAS) office and District Executive Directors (DED).

Furthermore the researcher got permit from District Administration Secretary and District Executive Director to allow him to collect in targeted districts. Also the researcher assured participants with the confidentiality of the information provided in the interview, documentary reviews and questionnaires, that all information asked by the researcher will be confidential and for research purpose only and not for victimization.

# CHAPTER FOUR

# PRESENTATION, ANALYSIS AND DISCUSSION

## 4.1 Introduction

This chapter is a presentation of the findings on assessment of ICT support services for rural OUT students. The main aspects of the study findings are presented and discussed in line with demographic characteristics of the respondents and the research objectives which focused on exploration of Open University of Tanzania’s rural students’ perceptions of using ICT for learning; examination of the cost of using ICT for teaching and learning at the Open University of Tanzania and ensuing implications; assessing the availability of ICT support services for rural students at OUT and assessing mastery of ICT skills for learning at higher education, specifically at OUT.

## 4.2 Respondents’ Demographic Characteristics

### 4.2.1 Age of the Respondents

Age of the respondents was grouped into four categories. Majorities (73%) of them fell under the age group ranging 18-37 years. Another proportion (26%) of respondents were under the age group ranging 38-57 years. Only 1% of respondents were under the age group of 58 years and above as shown in Table 4.1.

Table 4.2: Respondents’ Age Groups

|  |  |  |
| --- | --- | --- |
| **Age group (Years)** | **Frequency** | **%** |
| 18-37 | 73 | 73 |
| 38-57 | 26 | 26 |
| 58 and above | 1 | 1 |

**Source:** Field data, 2019

These findings depicted that, youth are ahead on advancing their professions through the Open University of Tanzania when compared with their elder peer teacher. The researcher observed that, most youths under the 18-37 group were aware of the role of using ICT for advancing their careers and academic profession through distance learning compared to the groups with older peers.

### 4.2.2 Respondents’ Gender

Gender of the respondents was considered because both sexes had different perceptions on access and use of ICT support and they were affected differently by the environment and culture. Majority (89%) of respondents were male than female who were only 11% as shown in Table 4.2.

Table 4.3: Respondents’ Gender

|  |  |  |
| --- | --- | --- |
| **Gender of the respondents** | **Frequency** | **%** |
| Male  | 89 | 89 |
| Female | 11 | 11 |

**Source:** Field data, 2019

These findings revealed gender imbalances on access to university education and particularly on using ICT based support. This was due to the facts that, women are still laid behind due to various negative social and cultural aspects and perceptions in their roles and access to education in most African community ,Tanzania in Particular. Regardless of giant steps have been made by the government of Tanzania regarding gender balance, women still have less access to education, limited time to engage in education and high levels of poverty which have consistently made them not to have equitable access and opportunities to ICT related education and training opportunities.

The study further unveiled that; women are more illiterate on the use of ICT services compared to men. Yet, both sexes were considered important in this study since they encompass different perceptions and experiences on access to ICT support services. These findings are in line with a study conducted by Tinlo (2002) who argued that, women have low access to ICTs compared to men due to inadequate time to deal with the many social-cultural responsibilities and high illiteracy rate as well as lack of mobility, they are largely set apart as home makers. The study found out that, distance learning offered by OUT through ICT support services can emancipate women from illiteracy since the women can use ICT to attend their family and job roles concurrently with their studies at OUT by John, (2017).

### 4.2.3 Respondents’ Education Levels

The respondent’s level of education of this study’s respondents was considered important since it does not only determine their awareness on ICT support services but also our understanding of their access to and potentials for ICT related education and training. The results showed that, majority (84%) of the respondents were pursuing bachelor degree while about 10% were pursuing master degree programmes and slightly 6% of respondents were pursuing Diploma as indicated in Figure 4.1.

Figure 4.2: Respondents’ Education Level

Source: Field data, 2019

The researcher also was interested to know the current status of the student pursuing their studies at OUT. The study finding revealed that, majority (89%) of the respondents were employed in different institutions and a few of them (11%) were fresh from high schools. This implied that, most of the people in Tanzania depended on distance learning through OUT to upgrade their levels of education hence there is a need for better provision of ICT support services for majority Tanzania to enhance their access to distance learning materials and administrative services while they study while working at their varied work locations.

The study observed that OUT provides more opportunities for the employed personnel to pursue studies through ICT-based distance learning a process that reduced enhanced the flexibility of accommodating tight work schedules that might have limited their chances to attend university level of education in normal conventional classes at the universities campuses. This result concurs with the Kagugu’s findings (2011) who found that, OUT gave opportunities to interested people engaging into different activities to undertake higher education studies though distance learning. Thus better ICT-based support services enhance the achievement of intended higher educational goals. Therefore, the researcher found that, using ICT support services workers were able to upgrade their academic professions and career through distance learning.

**4.3 The Open University of Tanzania’s Rural Students’ Perception of Using ICT for Their Learning**

The first research objective addressed in the current study was the exploration of the Open University of Tanzania’s rural students’ perceptions of using ICT for their learning. As reported earlier in chapter 3, various research instruments were used including interviews, observation, documentary reviews and questionnaires to collect data required to obtain data related to this objective. OUT’s rural students, internet service provider and OUT staffs were involved as respondents for this particular aspect. In the analysis of the findings, various perceptions of using ICT for the rural students learning through open and distance education were discussed as indicated in Figure 4.2.

Figure 4.3: OUT’s Rural Students’ Perception of Using ICT for their Learning

**Source:** Field data 2019

The findings presented in figure 4.2 show how OUT students’ perception of using ICT facilitate their learning activities. For example, about 92% of the respondents perceived that internet access facilitated their learning processes, since most of them were able to surf studying materials from the internet due to availability of relevant networks that support internet services, 85% of the respondents perceived that geographical location affected their use of ICT because of being far from the ICT support services since some of their geographical location is limited to internet access. Seventy five(75%) of the respondents perceived that the provision of ICT facilitated learning processes for OUT students in rural areas as they were able to communicate with their facilitators and 51% of the respondents perceived that ICT policy facilitate OUT students’ learning process in rural areas.

### 4.3.1 Perceptions on the Internet Access

The analysis on the Open University of Tanzania’s rural students’ perception of using ICT for their learning was done qualitatively and quantitatively. The qualitative data obtained in this study revealed that most of students in rural areas experience the problem of internet services to access various learning materials in pursuing their studies due to lack of network in rural areas. This was noted by one student from district C who stated that:

*In reality, as students who reside in rural areas, we experience a challenge of accessing internet due to lack of relevant networks that support internet services, this condition discourages students (Interview with one, student1, at District C: 12th June, 2019).*

This observation was also confirmed by one of the OUT- staff members who pointed out that:

*One of the major challenge that hinder Open University students particularly those of rural areas is limited-to-lack of access to use internet services since there are no suitable working networks as well as connected username service centers in rural areas. This led to delay of information to or from university to the students’ assignments, instructions and, feedback from academic staff and overall updates of activities and related schedules (Interview with, Staff 3, OUT: 10th June, 2019*).

The condition of access to internet seemed to be an unresolved matter due to shortage of electrical power related to infrastructure as well as equipment. This was advocated by one internet service provider in district B as stated:

*Actually we have received some complaints pertaining to internet services from OUT students, but the problem is shortage of electricity to run various machines, hence it is costly to use cell phone networks to be established in rural areas without electrical power (Interview, Internet service provider, District B : 18th June, 2019)*

The above interview quotes suggested that most of the students in rural areas perceived that, rural areas experience problem of internet services to access various learning materials in pursuing their studies due to lack of network in those areas which result into delaying of information to or from the university to the students as well as from the students to the institution or individual staff members. The respondents’ responses concurred with Ghavifekr and Rosdy (2015) who argued that lack of adequate ICT facilities and internet access were the key problems that students specifically in rural areas were currently facing now.

However, it was commented during various interview sessions that the Tanzania government has major plan to supply electricity in all rural areas; if this is accomplished it will increase opportunities for to majority rural Tanzanian student to undertake university studies through OUT and other distance learning institutions in the country. Access to internet services has a huge potential to enhance academic support services through students’ access to e-libraries across the globe as well as between and among learners and their teaching staff.

In quantitative data, the data collected from questionnaires revealed that about 92% of the respondent perceived that internet services as part of ICT infrastructure facilitated learning activities for their studies in rural areas as indicated in Fig 4.2. This shows that majority of students perceived that the use of internet services facilitates learning activities at OUT in rural areas where ICT as well as internet facilities and electricity are available and accessible by the learners.

### 4.3.2 Students’ Perception of Using ICT Based on Geographical Location

 The findings revealed that some areas in rural were scattered, distant from each other and not easily accessible, this made it difficult for some students to meet, discuss and share their academic issues as well as teach each other how to use ICT to facilitate their learning. This was emphasized by a student of District D as captured from the data below:

*Most of our district are characterized by rural elements including residential areas that are scattered, distant and not easy to be accessed by students this made it difficult for us as students to meet, discuss and share our academic issues frequently as well as use and address challenges on how to use ICT in facilitating our learning activities (Interview with, a Student 1, at District D: 1st July, 2019).*

As student of district B reiterated:

*Most of us lack clear and recurrent information from our colleagues and our supervisors because we live at interior locations which are very far from other places which include OUT centre where we could access ICT facilities as well as from other students residents (Interview with, Student 2,in District B: 18th June, 2019).*

The above cited interview quotes suggest that most OUT students in rural areas perceived that some areas in rural Tanzania are scattered, distant from town or cities and not easily to be accessible. Due to these conditions it was difficult for some students to meet, discuss and share their academic issues as well as how to use ICT in facilitating their learning, hence their geographical location affect the use of ICT and internet services to support their learning activities. These findings reflected Amin (2010) that ICT based services increase flexibility to the learners through access education and learning materials regardless of time and geographical barriers since it influence the way students learns to provide rich environment and motivation on the process of learning by offering new possibilities for learners and their instructors.

About85% of the respondents perceived that geographical location affect the usage of ICT as shown in Fig. 4.2. This indicated that learners’ geographical location played a role either to increase decrease the or usage of ICT and internet in facilitating learning process. This was emphasized by a student of District C as captured from the data:

*Most of our district are characterized by rural elements including residential areas that are scattered, which made it difficult for us as students to meet, discuss and share our academic issues frequently via ICT and internet support services (Interview with Student 3, at District C: 23rd June, 2019).*

Physical barriers present different challenges for offline versus online communication… Place is a barrier if you try to communicate with people on a channel they do not already use, or where they are not receptive to the information you are trying to share, Girardin L (2018). Therefore, geographical location affected distance learners since it was difficult students to meet for discussion through ICT support services because some of rural areas are limited to ICT support services and internet networks.

### 4.3.3 OUT Students’ Perceptions on the Provision of ICT – Based Education Support Services in Rural Areas

Data collected from interview revealed that some students perceived that the provision of ICT education to enable the use of ICT to facilitate academic matters as well as acquiring students’ own ICT user skills for their basic applications is not inadequate because the ICT support services rely on distance learning that is favoured by sufficient network and electric power which is generally not available in rural areas.

This was reported by a student from district A who cited that:

*I believe that the ICT education is not suitable for students in rural areas, because the system of acquiring ICT education based on distance learning including directions, information and accessing learning materials is done through internet services which require abundant supply of electricity and internet networks to support this learning activities, yet in most rural areas there is no or highly limited availability of electricity power supply and internet networks (Interview with, Student 3, in District A: 13th June, 2019).*

The above interview quotes suggest that some students perceived that the provision of ICT education to OUT students in rural areas facilitating academic matter as well as acquiring their own ICT and internet user skills for their basic applications are not inadequate because the system set up relies on distance learning that require sufficient internet network and electric power networks which are highly constrained in rural areas. This is similar to the study conducted by Kasinathan (2018) who argued that ICT education provided to students in rural and remote areas with access to capacity building opportunities, though ICTs for education has not been found to be highly relevant to teaching and learning subject because its adaptation in learning process has been limited due to inadequate supply of power in many rural areas.

About 75% of the respondents perceived that the provision of ICT facilitate learning process to OUT students in rural areas as shown in Fig. 4.2. This shows that three quarters of the respondents believe that the provision of ICT education has the potential to facilitate OUT learning process in rural areas if and when ICT, electricity power and internet networks are made available.

### 4.3.4 Perception of ICT Policy and its Impact on ICT – Based Education Support Services to Rural OUT Students

It was revealed from the research that some students in rural areas are not favoured by the ICT policy since the policy emphasizes the practice of online distance education while the resources are not sufficient in such locations. This was noted by an OUT staff to the citation that:

*Tanzania policy of ICT seems to favour the practice of distance online education as the government emphasizes the need for universal access to ICT services in the country, currently resources available are not enough to implement the proposed policies as it need for universal access to ICT services in the country (Interview with, a Staff 1, of the OUT staff: 7th June, 2019)*

This was also confirmed by the documentary reviews on the ICT policy for basic education for 2007 sections 3.1 and 3.2 which presented that:

*The ICT policy ensures that there is equitable access to ICT resources by students, teachers, facilitators and administrators in all regions and all types of educational institutions and offices, while it encounters inadequate infrastructure, including critical supporting infrastructure such as electricity and telecommunication systems, especially in rural and remote areas (MoEVT, 2007: 2).*

The quotations above suggest that some students in rural areas are not favoured by the ICT policy since the policy emphasizes the practice of online distance education while the resources are not sufficient to support learning activities in majority rural areas. This is similar to Ghavifekr and Rosdy’s position (2015) showing that ICT based services require proper planning and policy making as national ICT policies if it is not well planned to support online learning since it provides a rationale, a set of goals, and a vision of how ICT education is integrated into teaching and learning processes for accessing information and communication in all areas with sufficient supportive resources.

The data obtained from questionnaires revealed that about 51% of the respondents perceived that ICT policy has the potential to facilitate OUT students’ learning processes in rural areas as indicated in Fig. 4.2. This means that almost a half of this study’s respondents believed that ICT national policy can play a major role in facilitating learning process at OUT students in rural areas. Vasudevaiah G(2016),mentioned Advantages Of ICT In Distance Education Sector as follows;1.Faster and flexible course delivery, 2. ICTs enables distance education institutions to provide knowledge within reach of all, 3. Enhanced pedagogical and course design skills in distance education, 4.Various areas of educational administration and management require ICT help at different levels, 5.

Enhanced collaboration and interaction in distance education, 6.Preparation of teaching learning materials for distance education, 7. ICT support services have the role of library and information services for distance education, 8.Evaluation processes including assignment, questionnaires and submitting responses online being applied successfully with the help of ICT, 9. ICT is helpful for research including formulation of hypothesis, preparation of objectives, Data collection, Interpretation and analysis and Reporting. Open and distance learning is getting more dependent on information and communication technology (ICT) and has been playing an important role in the delivery strategies of distance learning, (Rahman H, 2014). The more ICT support services is being advanced, distance education is also improving.

### 4.3.5 Number of OUT Students Pursuing University Studies at Rural Areas

OUT learners who were interviewed revealed that some students thought that there were very few students who undertook OUT studies at rural areas. They considered this as a problem which made it difficult to use ICT, share ideas, integrating their knowledge and skills as well as cooperating among themselves towards the use of ICT as a support service at OUT.. This was advanced by one of the students at district C. The student informed the researcher that:

*In rural areas there are very few students who undertake OUT studies to the extent that their number are not enough to make collaboration, sharing integrating ideas in overcoming the challenges of using ICT to enhance teaching and learning.. For instance, in district I ‘m the only one student undertook OUT studies in past years to date… Just imagine how I will strive to suffice on my own in using ICT for my studies at the rural location? (Interview with, student 2, at District C: 23rd June, 2019).*

The interview quoted above suggested that students in rural areas thought that there were very few students who undertook OUT studies which make it difficult to use ICT that enable them, to share ideas, integrate their knowledge and skills as well as cooperating among themselves towards the use of ICT in pursuing their studies. Contrary to an Asian Development Bank (2017) report showing that now days many countries such as Nepal and, Sri Lanka, regardless of number of students undertaking courses in different districts, the learners were connected to their districts through the internet using long-range wireless devices and customized local antennae to empower students by connecting them to the outside world, their institutions and accessing various teaching and learning materials across the world using e-learning sites including libraries.

Addah, et al., (2012) cited that, the ICT in Education Policy is based on the premise that there are several key elements that underpin the use of information technologies. These include teaching and learning; management and administration; communication; and access to information. Furthermore, it is recognized that these elements will be dependent on policy reforms, both within education sector as well as within other related sectors including communications, local government and rural development, Addah, *et al.* (2012) cited importance of e-learning as follows;

Provide multiple avenues for professional development of both pre-service and in service teachers, especially through distance education Facilitate improved teaching and learning processes I. Improve teacher knowledge, skills and attitudes and even inquiry, 2. Improve educational management processes, 3. Improve the consistency and quality of instruction both for formal and non-formal, 4. Education increase opportunities for more student centred pedagogical approaches, 5. Promote inclusive education by addressing inequalities in gender, language, disability, 6. Widen the traditional sources of information and knowledge, 7. Foster collaboration, creativity, higher order thinking skills, 8. Provide for flexibility of delivery, 9. Reach student populations outside traditional education systems.

Benefits of e-learning with the Natural Step (UAC, 2020); The Natural Step’s courses are rich multimedia experiences designed by professional educators for maximum accessibility and learning. They offer a number of benefits compared to conventional training approaches.

**Lifelong learning for all learning styles:** E-learning is a key means of delivering lifelong learning, cultivating a culture of innovation and expanding productivity. E-learning environments allow learners to move at their own pace and can be more effective for learners who are shy, reflective, or require more time to absorb information.

**Quality control and consistency:** E-learning provides a consistent delivery of material and builds a shared language and understanding in the workplace; it also allows employers to customize content and monitor employee’s progress. With long-term licenses, employees can also review material at their convenience thereby ensuring uptake.

**Increased productivity and decreased expenditures:** E-learning can be completed at the time and place that is most convenient for the employer and employee. This saves time and reduces or eliminates travel and printing costs. E-learning is the most cost effective means for training large numbers of employees and allows follow-up training to be more focused and effective.

Therefore ICT support services trigger improvement of distance learning since learners are able surf and communicate with their facilitators as well as comrades.

## 4.4 The Cost of Using ICT as Support Service for Teaching and Learning at the Open University of Tanzania

The second research objective addressed in the current study was to investigate the costs of using ICT to support teaching and learning at the Open University of Tanzania. The study was also thought to investigate ensuing implications of the cost incurred in affording or accessing ICT equipment and/or services. In addressing this research objective, various research instruments were used; they included interviews, observation lists, documentary review and questionnaires. These instruments were administered to OUT’ students residing at rural locations, internet service providers and OUT staff. In the analysis of the findings showed that the cost incurred topurchase or access ICT as a support for teaching and learning at Open University of Tanzania. The cost was considered under two types of the cost, incurred by the students and the cost incurred by the university management authority: Travelling cost were incurred by students when attending the OUT regional centre at Sumbawanga. One of the students at District B noted that

 *We spend tsh 6,000/= as travelling cost to attend tests, examinations, administrative issues as well as face-to-face sessions*.( *Interview with, a student 3, in District B: 19th June,2019*).

The interview quotation suggested that most of OUT students incurred some costs to attend the OUT regional centre frequently.

### 4.4.1 The Costs of Using ICT for Teaching and Learning Activities Incurred by the Students

The findings revealed that there are various costs incurred by the students including purchasing ICT devices, accessing internet services from providers and travelling cost to and from Sumbawanga.

#### 4.4.1.1 Cost Incurred by Rural Students for Purchasing ICT Devices

The findings from interviews revealed that most of the students incur some costs in purchasing and possessing some ICT devices which are necessary to facilitate and accomplish their studies in rural areas. One of the students at District D which noted that;

*Our university studies need some ICT devices to accomplish most academic responsibilities required by the university. These devices include hardware such as mobile phones, internet equipment, and computers or laptops, all of which are necessary for accessing internet sites and developing research reports as well as processing other academic data(Interview with, a student 4, in District D: 4th July, 2019).*

The above interview quotation suggested that most of OUT students incur some costs in purchasing ICT devices which are necessary to facilitate their learning process in rural areas.About 98% of the respondents purchase and possess ICT devices to sustain their studies in rural areas. This shows that most of the students in rural areas buy those devices to support their studies in higher learning institution particular OUT.

#### 4.4.1.2 Cost Incurred By Rural Students to Access Internet Services

Other costs which were identified in the study were the cost access to internet facilities and services. The findings revealed that most of the students incurred some cost to access internet services such as surfing to obtain teaching and learning materials and communicate through emails and other social media platforms. This was asserted by a student from district B as cited here under

*The costliest aspect such as phone data credits that we incur in our day to day study processes is accessing internet networks. This is because most of our time as students of OUT, we spend in searching for learning materials to accomplish task such as course assignment, accessing emails and writing research or project reports. Therefore, every time we need to buy internet bundles whenever necessary so as to respond to particular tasks (Interview with, student 3, at District B: 19th June, 2019).*

The quotation from an interview with student 3 suggested that OUT students accessed internet services as they surfed for teaching and learning materials as well as communicate with peers and staff through emails. In such case, they incur cost to purchase internet bundles, update hard and soft ware.About 91% of the OUT students spend most of their money to access internet services in rural areas as shown in Table 4.3. This shows most of the students incur their costs to access internet services in rural areas.

#### 4.4.1.3 Travelling Costs

Travelling costs were incurred by the students particular those from rural areas. Data collected from interviews revealed that rural students incurred a lot of travelling costs from their origin points of residence to OUT centers as well as the areas where they could access internet services. This was advanced by a student from district A as reflected in the citation:

*Several times, we travel from our homes or working stations to the OUT Region Center which is located in an urban location to have access more information about university’s requisites and schedules. Furthermore, we often travel from our homes or working stations to areas where we can access internet services for learning activities; we use bodaboda and other type of vehicles as charges for both planned and unplanned movements (Interview with, student 4 from, District A: 14th June, 2019).*

Another student added that:

*I travel more than 61 kilometers to town to get internet services for my studies. I must incur transport cost from the village where I work and also paying airtime at private internet cafes to get internet services. Even when you come here at internet cafe with your computer you must pay Tsh1000 per hour to be connected with internet (Interview with, student 4, at District C: 25th June, 2019).*

The interview quotation in the preceding paragraph suggested that students in rural areas incurred a lot of travelling costs from their homes or residence to OUT centers, and internet cafe for internet services.About 95% of the respondents spent their money to travel from their home to OUT Regional centre.

### 4.4.2 The Costs of Using ICT for Teaching and Learning Activities Incurred By the OUT Management Authority

Findings revealed that, there are costs incurred by the Open University of Tanzania management authority, including the costs of conducting various ICT seminars and workshops, utilizing electric power and the cost incurred to facilitate teaching and learning activities.

#### 4.4.2.1 ICT Seminars and Workshops’ Cost

The data collected from interview revealed that the Open University of Tanzania incurred cost to conduct various seminars and workshops of rural area students on how to use ICT support services basic skills which helped them for learning activities. This was asserted by one of the OUT staff as cited;

*Institution covers the whole country, therefore it calls for seminars and workshops in the OUT centers to provide students with basic ICT skills to facilitate effective participation of distance learners through accessing internet services, computer skills, micro-soft word, excel, power points and other skills to accomplish assignments and other university tasks for learning activities (Interview with, Staff 4, at the OUT Region Center: 8th June, 2019).*

The interview quotation suggested that Open University of Tanzania incurs cost to conduct seminars and workshops especially to students of rural areas how to use ICT support services on basic skills that help them in their learning activities, including accessing internet, computer skills, micro-soft word, excel, power points and other skills to accomplish assignments and other university’s tasks in learning activities. These findings concurred with Asian Development Bank (2017) that most of higher learning institutions incur cost of internet and conduct seminars to sustain the high price for their services, though there is differential rate of costs in conducting seminars by rural and urban, poor and rich students.

#### 4.4.2.2 Electric Power’s Cost

The OUT management authority incurred electrical power’s cost. The study revealed that the OUT management incurred some costs to utilized electrical power to in all system of teaching and learning processes in all OUT centers. This was advanced by one of the OUT staff as cited:

*The Open University of Tanzania incurred electric charges, and most of charges were due to the use of ICT support services to conduct teaching and learning activities because most of distance teaching and learning processes were organized and conducted by using ICT support services (Interview with, Staff 8, at OUT staff: 9th June, 2019).*

Also this was noticed in documentary reviews at OUT office as cited:

*LUKU documents showed electrical charges of OUT institutions per one OUT center, where the center consume approximately Tsh.432, 000/= per month (Documentary review with, the region OUT’s office/LUKU charges: 7th September, 2019).*

The quotation suggested that the OUT management authority incurred cost of electrical power for teaching and learning processes in its centers.

#### 4.4.2.3 The OUT Teaching and Learning Processes’ Cost

The Open University of Tanzania incurred cost of teaching and learning activities for ICT support services. The study revealed that the OUT incurred cost of teaching and learning activities for internet services at the OUT centers, such as operating online library services, Student Academic Register Information System and online connection between student and the authority. This was noted by one of the OUT staff that:

*The Open University Of Tanzania incurred cost for distance learning processes to enhance internet services for the OUT centers, such as operating online library services, Student Academic Register Information System and online connection between student and the authority(Interview with, a Staff 5,at OUT staff: 8th September, 2019).*

The OUT management authority also incurred the cost to buy ICT support services for teaching and learning facilities, as noted by one of the OUT staff that:

*The OUT management incurred the cost to buy ICT facilities such as projectors, computer devices and other ICT support services’ devices to facilitate teaching and learning activities(Interview with, a Staff 2, at OUT staff: 7th September, 2019).*

The interview quotation suggested that the OUT management incurred the cost for the OUT center to enhance online library services, Student Academic Register Information System, online connection between student and the authority and buying ICT support services’ facilities such as projectors, computer devices and other ICT support services’ devices to facilitate teaching and learning activities. Similar to Ghavifekr and Rosdy (2015) that the institution has always implant the culture to enhance facilitators for training for upgrading themselves, buying, operating and integrating ICT in classroom to enhance teaching and learning process including laptop, one projector with screen, one pair of speakers, and internet modem with connection.

##

## 4.5 Availability of ICT Support Services for OUT’s Rural Students

The third research objective addressed in the current study was to examine the availability of ICT support services for OUT rural students. In addressing this research objective, various research instruments were used including interviews, observation, documentary reviews and questionnaires which were administered to OUT rural students, internet service provider and OUT staffs. In this aspect, all respondents were supposed to respond in each aspect on availability of ICT based support services. In the analysis of the findings, the availability of ICT based support services for rural students at OUT were discussed below:

Table 4.4: Availability of ICT Support Services

|  |  |  |
| --- | --- | --- |
| **Available ICT based support services** | **Frequency**  | **%** |
| Mobile and telephone network | 94 | 94 |
| Laptop/desktop | 91 | 91 |
| SARIS | 88 | 88 |
| MOODLE online library | 69 | 69 |
| Accessibility of internet services | 51 | 51 |
| Email  | 44 | 44 |

**Source:** field data 2019

### 4.5.1 Availability of Mobile and Telephone Networks

Availability of mobile and telephone networks in rural areas affected ICT support services for the students who undertook OUT studies. The study revealed that availability of mobile phone such as smart phones and telephone network had the role to facilitate ICT support service for rural and urban students, however in rural areas there was no or little mobile and telephones internet networks for online studies. This was emphasized by a student of district B as cited that:

*The importance of mobile phone and telephone network was to access internet, for online studies, however in rural areas there was as great problem of networks, either very little and slow network or not at all! (Interview with, a student 4, at District B: 20th September, 2019).*

The quotation suggested that availability of mobile phone especially smart phones with internet network had the role of facilitating ICT support services’ activities for OUT students, however in rural areas there is no or little mobile and telephones internet networks for online studies.

The study revealed that, about 94% of the respondents used mobile networks in rural areas to facilitate and support to undertake OUT studies as indicated in Table 4.4.This shows that majority of respondents used supportive mobile phones (smart phones) to pursue their OUT studies in rural areas.

### 4.5.2 Availability of Student Academic Register Information System

Availability of Student Academic Register Information System was identified as ICT support services for rural students at OUT. The findings revealed that the OUT operates Student Academic Register Information System (SARIS) which help students to access their examination results and other important academic issue.

This was argued by one of the OUT staff as cited that:

*One of the important online services that we effective shared with our students regardless with their locations was Student Academic Register Information System which allowed them to access and check their examination results and allowed us as the OUT staff to cross-check and analyzing students examination results (Interview with, a staff 3, at District B: 8th September, 2019).*

The quotation suggested that the OUT operated Student Academic Register Information System (SARIS) which helped students to access their examination results and other academic issues as ICT support services for students particular those of rural. These relate with findings of Asian Development Bank (2017) that most of the higher tertiary-level academic institutions have started an online admission process where students can send and receive feedback in short time.Data collected from questionnaires revealed that most of the student use SARIS as ICT support services for rural students at OUT, since about 88% respondents preferred to use SARIS to support them to obtain relevant information concerning their studies as indicated in Table 4.4.

### 4.5.3 Availability and Accessibility of Internet Services

Availability and accessibility of internet services was another ICT support services for OUT rural students. The data collected from interview revealed that internet was needed in accessing learning materials and teaching and learning process, however in rural areas internet services was still to problem to access internet in some areas. This was noted by a student 3 at district C as cited:

*We need internet services to access teaching and learning material and other processes for distance learning. There is availability of network in some few places that we use to access internet (Interview with, a student 3, at District D: 3rd July, 2019).*

The interview quotation suggested that availability of internet services was needed in accessing learning materials and practice teaching and learning process as ICT support services of OUT students in rural areas; however in rural areas internet services is still problem to access in some areas. This finding concurs with Mikre (2011) that, the internet is useful to improve the overall standard of education in the country by reducing the gap in quality of education between education institutions in urban and rural areas.

Data collected from questionnaires revealed that about 51% of the respondents used internet services to access teaching and learning process as shown in Table 4.4. This showed that almost a half of the respondents were accessible to internet services while the rest had no access to internet as the result of limited network services.

### 4.5.4 Availability of Online Library Services

Availability of online library services was another ICT support services for OUT rural students. Data collected from interview revealed that online library services supported students’ studies as it helped students to access various teaching and learning materials including dissertations, articles, journals. This was asserted by a student at district C which cited that:

 *There is OUT called online library that help us as students to access various teaching and learning materials including dissertations, articles, journals, books and others up to date information concerning teaching and learning processes done by other scholars. (Interview with, a student 3, at District C: 24thJuly, 2019).*

The interview quotation suggested that online library services was among of available ICT support services to support students in rural areas for their studies through accessing various teaching and learning materials including dissertations, articles and journals done by other scholars. Similar to Asian Development Bank (2017) that some higher learning developed web-based platform where the digital copy of all textbooks is made available where staffs and students can choose any chapter of the book, articles stored in PDF format to make them interactive so that one can get particular topic, additional related information, images and video that the availability of library online services provide students with the ability to use ICT to learn.

The study revealed that about 69% of the respondents used online library services to acquire necessary teaching and learning materials as shown in Table 4.4. This implies that approximately three quarter of the respondents used online library services for their OUT studies in rural areas.

### 4.5.5 Means of Communication between OUT Students in Rural Areas and OUT Management Authority

The interview revealed that, most of the OUT students were from rural areas who cannot afford to travel to OUT regional centers frequently, they communicated with their tutors in case of assistance or any difficulties. Some students used telephone to communicate with their instructors to reduce cost of face to face interaction since most of them worked far from OUT regional office center.

This was argued by a student of district A:

*I use telephone to communicate with my tutors and supervisors rather that spending more money for fare from my district to OUT regional offices. I mostly received instructions and directives how to study through telephone or mobile phones communication (Interview with, a Student 1, at District A: 11th September, 2019).*

Other students preferred to communicate with their instructors through email address. This was advanced by a student of a district D as follows:

*There was a long time to communicate with the instructor through email depending on the essence of such communication. For instance when I wanted to respond to the assignment given, report writing and working toward corrections, I used email to accomplish those duties (Interview with, a Student 1, of a district D: 1st July 2019).*

The interview quotation suggested that means of communication were ICT support services to OUT students in rural areas as they use to communicate with their tutors for assistance or any difficulties including telephone or email to communicate with their instructors to reduce cost of face to face interaction since most of them worked and lived far distance from OUT regional office center. These findings concurred with Amin (2010) that the direct link between the authority and students in their learning activities can be brought by ICT to helps students in their learning by improving the communication between them and the instructors, Questionnaires revealed that about 44% of the respondents used available means of communication especially Email services to undertake their OUT studies in rural areas as shown in Table 4.4. This implied that less than a half of the respondents used email address to facilitate their studies.

## 4.6 The OUT’s Mastery of ICT Skills for Use in Learning at Higher Education

The fourth research objective addressed of the study was to assess mastery of ICT support services’ skills for learning at higher education, specifically at the OUT. In addressing this research objective, various research instruments which were used are interviews, observation, documentary reviews and questionnaires which were administered to OUT rural students, internet service provider and OUT staff. In the analysis of the findings, the mastering of ICT skills for use in learning at higher education was discussed:

Figure 4.4: Showing the Percentage of the OUT Mastery of ICT Skills for Use in Learning

The findings in the figure 3 indicated that the majority of respondents mastered the ICT support services’ skills for learning at OUT. For instance about 93% of the respondents were able to use computer and computer programs, about 94% of the respondents were able to access MOODLE and SARIS systems, 89% were able to access email and 78% of the respondents were able to use mobile phones in pursuing their studies.

### 4.6.1Ability to Use Computer and Computer Programmes

The interview and observations revealed that most of students were able to use computer and some computer programmes including, micro-soft word office, Microsoft excel, power point to facilitate their learning process. This was advanced by a student of a district B as shown:

*Yes, I know how to run computer for some computer programmes for my studies. Also I know how to operate computer programmes like micro-soft word in writing reports, micro-soft excel for some calculations in my reports as well as micro-soft power point to prepare slides to summarize my research works for presentation (Interview with, a student 2, of a District B: 18th September, 2019).*

This was also supported by observation as cited:

*The students of a district C were able to use micro-soft word in writing research reports and different assignments and also able to go through micro soft excel to tabulate data (Observation with, a Researcher, of a district C: 22nd -25th June, 2019).*

The quotations above suggested that most of OUT students in rural areas had mastery of skills of using computer and some computer programmes including, micro-soft word office, Microsoft excel, power point to facilitate their learning process. This was similar to Mikre (2011) some students who used tutorial software in learning computer scored significantly higher on their studies in many education institutions.

The questionnaires revealed that majority of the students mastered ICT support services’ skills by operating computer and computer programmes, since about 93% of the respondents were able to use of computer and computer programmes as shown in fig 3. This was shown on Table 5 which showed the ability of using computer and computer programmes, whereby about 90% of the respondents had ability to operate computer programmes, about 85% were able to use Microsoft word office, 52% were able to use Microsoft excel and 43% were able to use Microsoft power point. This shows that majority of respondents were able to master ICT skills, however their skills varies, this was due to usability of a particular programmes, and preference of students in using those computer programs programmes.

Table 4.5: Showing Ability to Use Computer/Computer Programmes

|  |  |  |
| --- | --- | --- |
| **Computer /Computer Programs** | **Frequency** | **Percentage of skills** |
| Ability to operate overall computer system | 90 | 90 |
| Ability to use Microsoft word office | 85 | 85 |
| Ability to use Microsoft Excel | 52 | 52 |
| Ability to use Microsoft Power Point | 43 | 43 |

**Source:** Field 2019

### 4.6.2Learners’ Ability to Access Email Services

The ability to access email was another ICT support services’ skills being done by students in learning activities at OUT. The respondents revealed that many OUT students had an ability of email to contact with their instructors, supervisors and university authority for academic issues by using their phone and laptops.

This was noted by a student of district C who informed that:

*I know all procedures of using email through my account. Through email I’m able to contact course instructors, my supervisor and responding to any issues concerning university authority as well as my entire process of learning*. *Sometime I use my smart phone or laptop (Interview with, a student 4, at District C: 25th September, 2019).*

The quotation above suggested that many OUT students in rural areas had skills to access email to contact with their instructors, supervisors and OUT management authority for academic issues through their phone and laptops. This concurred with Asian Development Bank (2017) report that indicated that students were able to access sent and received email messages to contact with distance educational institutions, the same to institutions that publish and distribute information to students on the web and email.

Questionnaires revealed that about 89% of the respondents were able to access email as indicated in figure 3. However few of the respondents were able to use other alternatives to obtain some information like travelling to OUT center to make face to face communication, make a phone call and other use postal address for the same purposes as shown in figure 4.4.

Figure 4.5: Means of Communication in Relation to ICT Skills

The findings in fig. 4.4 indicated the way that ICT support services’ skills could be integrated to the means of communication. For instance about 98% of the respondents used telephone communication, about 83% of the respondents used email communication, about 75% of the respondents used and accessed SARIS and MOODLE, 34% of the respondents preferred to face-to-face communication and 28% of the respondents used postal address.

### 4.6.3 Ability to Access MOODLE and SARIS Platforms

The interview revealed that OUT students had ability to access online library services that allowed them to easily obtain relevant learning materials for their studies and Student Academic Register Information System (SARIS) to support OUT student to make online registration and check academic reports.

This was noted by a student from district D who stated that:

*I can access online library to download learning materials for assignments or report writing from online library services. I also manage to SARIS system to check information about registration and related academic information (Interview with, a Student 2, at district D: 2nd September, 2019).*

The interview above suggested that OUT students had ability to access online library to download learning materials for assignments or report writing from online library and SARIS system to check information pertaining to registration and related academic information.

The data revealed that about 94% of the students had ability to access MOODLE and also use the SARIS systems as indicated in fig. 4.3. This shows that most of the students were able to access MOODLE and SARIS systems and only few (the remains) used website and other ICT support services’ skills to get more relevant information as indicated in table 6 and fig. 4.

Table 4.6: The Available ICT Systems in OUT

|  |  |  |
| --- | --- | --- |
| **Available ICT systems** | **Frequency** | **%** |
| Moodle | 97 | 97 |
| SARIS | 88 | 88 |
| WebsitePhones | 8178 | 8178 |

**Source:** Field data 2017

### 4.6.4 Ability to Use Mobile Phone in Pursing OUT Study Materials

The use of mobile phone in pursuing OUT studies was another ICT support services’ skills that were being used by OUT students. The data collected from interview revealed that most of the students in rural areas used their smart phones to undertake their studies and typing their assignments, research reports, accessing and surfing study materials and use their phones to connect the internet networks.

This was advanced by a student of district A who told the researcher that:

*My phone helps to pursue my studies. For example, this smart phone helps me to type some assignments and report before transfer them to laptop through USB cable. It also helps to surf relevant learning information through internet and lastly I often use it to connect to network after having an internet bundle by connecting to my laptop through hot spot (Interview with, a Student 2, in District A: 12th June, 2019).*

The interview quotation suggested that most of the students in rural areas were able to use smart phone for their studies by typing assignments, reports, accessing and surfing materials for their studies and use phones to connect the internet network.The data collected from questionnaires revealed that about 78% of the respondents were able to use mobile phones for their studies as indicated in fig 4.3. This meant that 78% of the respondents out of 100% of the respondents were using mobile phone to access internet, communicate, email and typing. the remain were not using mobile phones because they had no supportive phones (smart phones) and other used alternatives to get information of their studies as shown in fig. 4.4

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents a summary of the study; this is covered in chapter four, conclusions and recommendations. Furthermore, the report chapter provides the implications of the findings.

## 5.2 Summary of the Study

The purpose of the study was to assess ICT based support services for rural students at the Open University of Tanzania in Rukwa Region. The study was guided by four research objectives namely, exploration of Open University of Tanzania’s rural students’ perception of using ICT as support services for their learning; examining the cost of using ICT as support system for teaching and learning at the Open University of Tanzania and ensuing implication and their learning; assessing the availability of ICT based support services for rural students at the Open University of Tanzania and assessing mastery of ICT skills as support for learning at higher education, specifically at the OUT.

The literature review in this study covered different aspects including an overview of Information Communication Technologies (ICTs), Information Communication Technologies in education, ICT Use in open and distance learning, ICT at the Open University of Tanzania, challenges of using ICT distance education. The study was conducted in Rukwa Region in four selected districts including Rural Sumbawanga District, Kalambo District, Nkasi District and some rural areas of Sumbawanga Municipal District. The study employed mixed research approach using a survey research design.

The sample size was 116 respondents constituting 100 OUT students, 04 OUT staff, 08 graduates from the Open University of Tanzania and 04 internet service providers from the four districts in Rukwa Region. Purposive sampling and simple random sampling were used to select respondents in this study. On one hand, the qualitative data were collected from interview, observation and documentary review through OUT students, internet services provider and OUT staff. On the other hand, quantitative data were collected through questionnaires which were administered to OUT students.

Miles and Huberman (1994) analyzed that, data were analyzed through descriptive analysis for quantitative data and qualitative data. They also focused on six knowledge sources and knowledge transfers in the form of: 1) knowledge transition and sharing, such as shared or diffused knowledge; 2) knowledge transformation, such as knowledge from legacy service-systems or cultures; 3) inquired knowledge from domain or field, such as traditional acquisition related knowledge; 4) focused knowledge or led knowledge, such as regional R&D agenda or research consortium connected knowledge which can be adopted for radical innovations; 5) knowledge co-creation and knowledge building, such as improving knowledge collectively upon experience, quality or action data; and 6) artifact and service related embedded-implicit knowledge, such as knowledge inside a service-system which can only be observed.

## 5.3 Summary of Key Research Findings

The findings from studying the Open University of Tanzania rural students’ perceptions of using ICT as a support services for their learning, revealed that most of the students in rural areas experienced the problems of accessing internet services. Yet such services are necessary for the students to access various learning materials as they pursue their studies. Lack (or highly limited access) of internet networks in those areas resulted into delayed information to or from OUT. Also the OUT students who live in rural areas perceived that some areas in rural were scattered, from each other, hence it was not easy to access educational as well as administrative information through common communication systems. This situation made it difficult for them to meet, discuss and share their academic as well as administrative issues. They hardly meet to learn how to use ICT which facilitate their learning due to particular geographical location. Furthermore, some students perceived that the provision of ICT education to OUT students in rural areas would facilitate their academic progress as well as the acquisition of necessary skills to apply for basic academic work.

With regard to the costs of using ICT for teaching and learning at the Open University of Tanzania and ensuing implications, it was revealed that, the OUT students incurred some costs in purchasing ICT devices which are necessary to facilitate their learning processes ICT devices included among other mobile phones and laptops. Rural based students also incurred a lot of travelling costs from their homes or residence to OUT centers where they can access ICT gadgets and services. Moreover, the Open University of Tanzania incurred some costs to conduct various seminars and workshops students residing in rural areas A things which include ICT skills. Acquisition of such skills is critical if the sessions the students are to be competent to use as a support system for teaching and learning.

## 5.4 Conclusion

Based on the discussions and on the basis of findings above, it can be concluded that although most of the students in rural areas were able to use and access ICT support services to pursue their studies with supporting of available ICT support services still face problems of network to access internet, few number of students pursuing OUT studies, remote geographical location which led to the delayed academic information and made them to incur a lot of travel costs as they go to purchase own ICT devices and internet services from town and cities.

 For the case internet access, most of the students in rural areas perceived that, rural areas experienced problem of internet services to access various learning materials to pursue their studies due to lack of internet networks in those areas which resulted into delaying of information to or from the Open University of Tanzania to the students as well as from the students to the institution or individual staff members. But most of the students in rural areas were able to use smart phone for their studies by typing assignments, reports, accessing and surfing materials for their studies and use phones to connect the internet networks.

To ensure effective running of the distance teaching and learning processes, the OUT management incurred the cost for the OUT center to enhance online library services, Student Academic Register Information System, online connection between student and the authority and buying ICT support services’ facilities such as projectors, computer devices and other ICT support services’ devices to facilitate teaching and learning activities.

## 5.5 Recommendations

The following recommendations have been made to guide post research action so as to ensure that the report does not only stay in OUT shelves but its usefulness is ultimately realized.

### Recommendations for Action

The OUT regional centers could be decentrallised to district levels. The OUT regional center could introduce branches to districts so as to ensure sufficient services closer to students. Some students reside in rural areas and encounter problem of accessing internet networks, and incur a lot of cost as they travel to the Regional centers to access ICT and internet education facilities that support their learning.

The OUT regional centers should introduce face-to-face induction courses on ICT and internet services for new students as they register for online classes. Furthermore, each course tutor should develop a course journal portfolio type of assessment so as to ensure that students’ learning progress is regularly monitored and enhanced. Since the region contains only one OUT regional center that provides services to the entire Rukwa Region. Directors of OUT center should be obliged to initiate district level course tutorials that are monitored at given intervals by the regional OUT authorities. The Education Management Information System (EMIS) as well as tutorials about ICT skills and course lectures should be extended to district levels so as to enhance to provision of support services close to students in rural areas.

**5.5.2 Recommendations for Further Study**

As a result of this research output, several aspects have been recommended for further studies. Some of the important areas which have been recommended by the researcher for further studies. Finding out the effect of globalization wherein more and more contemporary ICT are used for educational support services regardless of the rural locations of majority learners in low developed countries including Tanzania.

Other studies could be carried out to compare the efficiency of ICT based support services for OUT students in rural and urban areas. It would also be useful for other studies on ICT as support services for more specific levels of OUT students (for instance non-degree, undergraduate and post graduate students) since experiences for each level of student vary.

# REFERENCES

Abidin, Z. A. Z. & Jacobs, M. (2010). *Recent Developments in Technology Enhanced and Computer-Assisted.* Bin Zou: Michael Thomas Publishers.

Addah, K., Kpebu, D., Olivia, A. T. & Kwapong, F. (20I2). Promoting e-learning in distance education programs in an African country, *E-Learning – Long-Distance and Lifelong Perspectives,* 3, 52-61.

Ajayi, S. I. (2003). Globalisation and Africa, [*Journal of African Economies*](https://ideas.repec.org/s/oup/jafrec.html)*,* 12, 120-150,

AlJeraisy, M. N., Mohammad, H., Fayyoumi, A. & Alrashideh, W. (2015). The effect of using online discussion forums on students, *Online* *Journal of Educational Technology -* *TOJET,* 14(2), 247-258.

Amin, S. N. (2010). *An effective use of ICT for education and learning by drawing on worldwide knowledge, research, and experience: ICT as a change agent.* Kshmir: University of Kashmir.

Ary, D., Jacobs, L. C. & Sorensen, C. K. (2010). *Introduction to research in education,* 8th Ed., Belmont: Wadsworth, Engage-Learning.

Asian Development Bank, (2017). Innovative strategies for accelerated human resource development in south Asia information and communication technology for education special focus on Bangladesh, Nepal, and Sri Lanka. Mandaluyong City: Asian Development Bank for Development Policy. New York. USA.

[Astalin](https://www.semanticscholar.org/author/P.-Astalin/117085385), P. (2013). Qualitative Research Designs: A Conceptual Framework; *International Journal of Social Sciences & Interdisciplinary Research Publications,* 2(1), 118-124.

Bates, T. W. (2008). Charting the Evolution of Lifelong Learning and Distance Higher Education:The Role of Research, retrieved on 20th January, 2020 from; http://www.tonybates.ca/wp-content/uploads/2008/07/research.pdf.

# Baxter, L. A. & Babbie, E. (2004). *The basic communication research, The Basics of Communication Research,* 1st Edition, Paperback: Amazon.

Bhat, A. (2020). *Business research methodology,* New York: Juta Publications.

Blurton, C. (2002). ICT Education for teachers and ICT supported instruction, AJOL publishers. *An International Multidisciplinary Journal, Ethiopia,* 8(2), 199-216.

Cohen, L., Manion, L. & Morrison, K. (2007). *Research methods in education,* 3rd Ed., New York: Routledge.

Creswell, J. (2012). *Educational research planning, conducting, and evaluating quantitative and qualitative research.* London: Library of Congress Cataloging-in-Publication Data.

Creswell, W. J. (2011). *Design and conducting mixed methods,* (2nd Ed). New York: Sage Publications.

Dawson, C. (2007). *A practical guide to research methods, a user-friendly manual for mastering research techniques and projects.* London: Spring Hill House.

Denscombe, M. (2007). The Good Research Guide or Small-Scale Social Research Projects, (3rd Ed). London: Open University Press Mcgraw-Hill Education.

Fischer, H. E., Boone, W. J. & Neumann, K. (2014). *Quantitative research designs and approaches; Taylor and Francis,* Rountledge Publishers.

Galanouli, D., Murphy, C. & Gardner, J. (2004) Teachers’ perceptions of the effectiveness of ICT competence training. *Computers* and *Education*, 43(2), *63*-79.

Garrison, D. R., & Baynton, M. (1987). Learner Support and Support Services.  *Online Journal of Distance Education-TOJDE,* 5(4), 1-10.

Ghavifekr, S. & Rosdy, W.A.W. (2015). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. *International Journal of Research in Education and Science (IJRES),* 1(2), 175-191.

Girardin, L. (2018). The 7 Barriers to Digital Communication; Communications Digital Government, retrieved on 21st March, 2019 from; <https://www.govloop.com/community>.

Glomb, N., Midenhall, T., Mason, L.,& Salzberg, C (2009). Reducing Isolation Through Regional Mentors and Learning Communities.: A way to Support Rural Learners. *Rural Special Education Quarterly,* 28(4), 31-35.

Gunton, (1993). Promoting Teaching and Learning in Ghanaian Basic Schools. Retrieved on 20th June, 2019 from; Eric Publishers.https://files.eric.ed. gov>full.

Hahn, N. D. (2012). Access, use and perceptions of teachers and students towards mobile phones as a tool for teaching and learning in Tanzania

Hameed, A. (2006). Impact of ICT on Educational Performance and its Efficiency, retrieved on 30th February, 2020 from; https://mpra.ub.uni-muenchen.de.

Hiltz, S. R., Johnson, K. D., & Turoff, M. (1991). Impact of Asynchronous Learning Networks On Individual and Group. R. Benbunan-Fich, 273.

Hosseini, S. J., Niknami, M. & Chizari, M. (2009). The Role of Extension in Adopting Solar Energy in Rural Areas Case of Carbon Sequestration Project. [*American Journal of Agricultural and Biological Science*](https://www.researchgate.net/journal/1557-4989_American_Journal_of_Agricultural_and_Biological_Science)*,* 6(1), 23-28.

# Jilcha, K. (2019). *Research Design and Methodology,* Paperback: Intechopen Publisher.

John, E. S. (2017). *Female Education in Developing Countries,* Paperback: Research Gate.

Jorge, H. C., Acosta, J. M., Garcia, E. C. & Diaz, M. B. (2003). Use of the ICTs and the perception of E- learning among University students; a Differential Perspective according to Gender and Degree Year group. *Interactive educational multimedia,* (7), 13 -28.

Judy, S. & Angela, C. (2008). ICT Teaching and learning in a new educational paradigm: Lecturers’ perceptions versus students’ experiences. Monash University. Caulfield East.

Kagugu, A. H. (2011). The Role of Information Communication Technologies, unpublished masters dissertation, Open University of Tanzania, Dar es Salaam.

Kasinathan, G. (2018). Domination and Emancipation: A Framework for Assessing ICT and Education Programs. Research into Open Educational Resources for Development.

Keengwe, J. (2007). *Laptop Initiative: Impact On Instructional*. Paperback: Research Gate publishers.

Kitti, M. R. (2014). Effect of Teaching Methods on Students’ Performance in Tanzanian Education Institutions: A Case of Public Secondary Schools in Nyamagana District - Mwanza. Unpublished Masters thesis, The Open University of Tanzania, Dar es Salaam, Tanzania.

# Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course, *International Review of Research in Open and Distance Learning,* 12(3), 19-38.

Kothari, C. R (2004). *Research Methodology, Methods and Techniques,* (2nd Ed). New Delhi: New Age International Ltd.

Krishna, K. (2012). Learner Support in Open and Distance Learning. Salt Lake: Open University Publication.

Kumar, R. (2011). *Research Methodology A Step-By-Step Guide For Beginners.* New Delhi: Sage Publications.

[Lenth](https://www.tandfonline.com/author/Lenth%2C%2BRussell%2BV), R. V. (2001). Some Practical Guidelines for Effective Sample Size Determination, *The American Statistician,* 55(3), 187-193.

Li, A. (2016). The Four Layers of a Smart ICT Infrastructure. Thessaloniki Publications, 3rd International Conference held on May 16-18, ICT 2016, Thessalonica, Greece.

Lim, C., Lee, J., Choi, C., Kilman, V.L., Kim, J., Park, S.M., Jang, S.K., Allada, R., Choe, J. (2011). The novel gene twenty-four defines a critical translational step, in the Drosophila clock. [*Nature,*470(7334), 399--403.](http://dx.doi.org/10.1038/nature09728)

Ling, L. H. & Tajik, A. J. (2002). Diagnostic value of mitral annular velocity for constrictive pericarditis in the absence of respiratory variation in mitral inflow velocity, *J Am Soc Echocardiogr,* 15(12), 1468-71.

Macintyre, R. &Macdonald, J.R. (2011). Remote from what? *Perspectives of Distance Learning students in remote rural areas of Scotland,* 12.4, 8-12.

Marczyk, G. R. & Festinger, D. (2005). *Essentials of Research Design and Methodology.* New York: John Wiley & Sons, Inc.

McCausland, M. A., Brown, M. R., Barrett, S. M., Diermar, J. A., Heasman, M. P., (1999). Aquaculture, Evaluation of live microalgae and microalgal pastes as supplementary food for juvenile Pacific (Crassostrea gigas), *Aquaculture*, 174(4), 323-342.

Mcharazo, M. M. & Oden, M. K. M (2000). ICT Based Support for Rural Students, unpublished masters thesis, the Open University of Tanzania, Dar es Salaam, Tanzania.

McQuaide, S. (2009). Making Education Equitable in Rural China through Distance Learning. Athabasca: Athabasca University Publisher.

Mikre, F. (2011). The Roles of Information Communication Technologies in Education Review Article with Emphasis to the Computer and Internet. *Ethiop. J. Educ. & Sc,* 6 (2), 1-13.

Miles, M. B, & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook,* 2nd Ed., Paperback: Sage.

Ministry of Education and Vocational Training. (2007). Information & Communication Technology (ICT), Policy for Basic Education. Dar es Salaam: MOEVT.

Moore, M. G. & Anderson, W. G. (2003). Handbook of Distance Education. ISEC publications. Mahwah, NJ.: Lawrence Erlbaum.

 Msuya, J. & Maro, F. (2002). The provision of library and information services to distance learners, unpublished masters dissertation, Open University of Tanzania, Dar es Salaam, Tanzania.

Nihuta, K. A. (2011). Collaborative Course Design to Support Implementation of E-Learning. PhD thesis, University of Twente, Netherlands.

Noss, R. & Pachler, N. (1999). Learning To Teach Using ICT inthe Secondary School, Marilyn Leask: Norbert Pachler Publishers.

Nuurrianti, J. (2016). Internet and democracy, media literacy, and information disorder in Southeast Asia. PhD thesis, [Northern State University NSU, College of](https://www.researchgate.net/institution/Northern_State_University) Arts and Sciences, Aberdeen, US.

Oliver, R. (2002). The Role of ICT in Higher Education for the 21st Century ICT as a Change Agent for Education. [***Journal of Software Engineering and Applications***](https://www.scirp.org/%28S%28lz5mqp453edsnp55rrgjct55%29%29/journal/Home.aspx?JournalID=45)*,* [9(5](https://www.scirp.org/%28S%28lz5mqp453edsnp55rrgjct55%29%29/journal/Home.aspx?IssueID=7971)), 1-10.

Omari, I. M. (2011). *Concepts and methods in Educational Research.* Dar es Salaam: Oxford University Press.

Owen, D., Hoyos, M., Green, A. E., Barnes, S. A., Behle, H., Baldauf, B. (2013). Literature Review on Employability, Inclusion and ICT, Report 2: ICT and Employability: The publication of Technical Report.

Owens, J., Hardcastle, A. L. & Richardson, B. (2009). Journal of Distance Education, *The Experience of Remote Students.* 23(3), 53-62.

Rabbi, M. F. & Arefin, M. A. (2006). International Conference on Communication Technology, 1-4, 2006, IEEE, New York,

Rahman, H. (2014). The Role of ICT in Open and Distance Education. Turkish *Online Journal of Distance Education*, *Turkish Online Journal of Distance Education*, 15(4), 162-169.

Robinson, V. M. J. (2008). Forging the links between distributed leadership and educational outcomes. *Journal of Educational Administration.*

Simpson, O. (2008). *Supporting students in Open and Distance Learning,* New Delhi: Kogan page.

Tinio, V. L. (2002). ICT in Education, United Nations Development Programme Bureau. USA.

Tripathi, A., Nile, A. H. & Bankaitis, V. A. (2014). PITPs as targets for selectively interfering with phosphoinositide signaling in cells. *Nat Chem Biol*, 10(1), 76-84.

United Republic of Tanzania, (2003). Small and Medium Enterprise Development Policy, Dar Es Salaam, Tanzania.

Vasileiou, K., Barnett, J., Thorpe, S. & Young, T. (2018). *Characterizing and justifying sample size sufficiency in interview-based studies.* Paperback: BMJ Publications.

Vasudevaiah, G. (2016). Promoting Usage of ICT in Open and Distance Education Programs; *The International Journal of Indian Psychology*, 3(3), 77-79.

Walliman, N. (2006). *Social Research Methods.* London: SAGE Publications.

Walsham, G., Daniel, R. & Sahay, S. (2007). Foreword: Special Issue on Information Systems in Developing Countries, *MIS Quarterly,* 31(2), 317-326.

Wilkinson, D. & Birmingham, P. (2003). *Using research instrument. A guide for researcher.* London: Routeledge falmer.

World Education Indicators, (1999). *Investing in Education; Analysis of the World Education Indicators,* OECD Publishers.

Wright, K., Turanovic, J. J. & Rodriquez, N. (2008).The role of knowledge Transfer in Open Innovation. Retrieved on 20th June, 2019 from; <https://books.google.co.tz>

Yamamoto, Y. & Morioka, T. (2018). ICT Integration inthe Educational System of Philippines. *Journal UMY.* Journal of Governance And Public Policy, 5(3), 261-280.

Zhao, J. Xiaoming, H. & Banerjee, I. (2006). The Diffusion of the Internet and Rural Development-ZhaoJinqiu, retrieved on 30th March, 2020 from; https://journals.sagepub.com.

# APPENDECES

**APPENDIX I: QUESTIONNAIRE FOR STUDENTS**

I am ***MWANAKULYA, AUDIFACE ALFREDY*** conducting a research titled as **“Assessment of ICT based Support Services for Rural OUT Students*,”*** in partial fulfillment of the requirements for the degree of Master of Education in Open and Distance Learning of the Open University of Tanzania. A study is being conducted among students of the Open University of Tanzania regarding ICT based support services for rural students of the Open University of Tanzania. You are kindly asked to respond by simply putting a tick or by filling some blank spaces provided. Remember this is not an examination and that there are no correct and wrong answers. You just need to provide answers that you believe are the most appropriate in each question or statement. I assure you that the information you provide will remain confidential and will be used only for the purpose of this study. Note that the information provided will assist distance learning institutions to improve teaching and learning process. Thank you very much for your readiness to participate fully.

1Age of the respondent; 18-37 Years (…) 38-57 Years (…) 58Years and above (….)

2 Gender; Male (……) Female (……)

3 Region of residence and OUT study: Rukwa (……………) Others (………….)

4. District of residence and OUT study…………………

6. Level of education pursued by OUT student (i) Diploma Yes ( ) No ( ) (ii) Bachelor degree Yes ( ) No ( ) (iii) Masters Yes ( ) No ( )

7 What are the available ICT based support services

1. Mobile and telephone network Yes ( ) No ( )
2. Laptop/desktop Yes ( ) No ( )
3. SARIS Yes ( ) No ( )
4. MOODLE online library Yes ( ) No ( )
5. Accessibility of internet services Yes ( ) No ( )
6. Email Yes ( ) No ( )

7. Do you own and use a computer?yes………….No…………..

If the answer is no in above how do you learn via distance?

……………………………………………………………………………………………………………………………………………………………………………………

8. Do you have students’ email account at the OUT? yes…………….no…………….

9 How many times do you use your email account for study reasons?a) once per week……….b) Once per c) month……….d) frequently……………….e) none of the above……………(f) other means of studying………………………………(provide explanation to clarify…………………………………………………………

10. Do you have a MOODLE account at your university ?Yes……………No……………………

11. Is electricity available at your village? yes………….No……………

11a. Is the quality of electricity supply sufficient to allow consistent /sustained study in the course of a week or month?.....yes....................No……….............

11b In cases of electricity outages what alternative do you have for electricity supply at your rural area? ……………………………………………………………………..

12 Is there any problem encountering the use of ICT services Yes ( ) No ( )

 What are those problems?

1. Problem of internet to access learning materials Yes ( ) No ( )
2. Problem of using ICT based on geographical location Yes ( ) No ( )
3. Problem on ICT education provided on using ICT based services Yes ( ) No ( )
4. Problem on ICT policy Yes ( ) No ( )
5. Others……………………….

13 If the answer is yes on each aspect on question 12 above, describe how?

14 Is there any cost incurred on using ICT based support services? Yes ( ) No ( )

15 If yes, what are those costs?

Purchasing and possessing the ICT devices Yes ( ) No ( )

Access internet services Yes ( ) No ( )

Travelling cost Yes ( ) No ( )

Others (specify)…………………..

16. How much money do you use buy mobile connectivity bundle (MB)?

17. Is internet connectivity available at your village? yes……….or No………..

18. If the answer is no above how do you get connected to the internet?

……………………………………………………………………………………………………………………………………………………………………………………………………………

19. What kind of source of power do you use?

a) Electricity……..b) solar…………c) Generator………….d) Candle? (this is not applicable here!!!!d) others…………

20. What challenges do you face when learning via ICT?

21. How do you rate the use of ICT at the Open University of Tanzania?

Poor……… Very poor…………….average……. Good…….. Very good….. Excellent………

22. When faced with challenges in learning via ICT do you get support from OUT staff?

Yes………….No……………….

23. What kind of support services do you get?

………………………………………………………………………………………………………………………………………………………………………………………………………….

24 What should OUT do to make sure there is smooth learning via ICT at Rukwa Region rural area where Open University of Tanzania students reside and ?

………………………………………………………………………………………………………

**APENDIX II: INTERVIEW GUIDE FOR OUT STAFF**

**DATE……………………….**

I am MWANAKULYA, AUDIFACE ALFREDY conducting a research titled as **“Assessment of ICT based Support Services for Rural OUT Students*,”*** in partial fulfillment of the requirements for the degree of Master of Education in Open and Distance Learning of the Open University of Tanzania. A study is being conducted among students of the Open University of Tanzania regarding ICT based support services for rural students of the Open University of Tanzania. You are kindly asked to respond by simply putting a tick or by filling some blank spaces provided. Remember this is not an examination and that there are no correct and wrong answers. You just need to provide answers that you believe are the most appropriate in each question or statement. I assure you that the information you provide will remain confidential and will be used only for the purpose of this study. Note that the information provided will assist distance learning institutions to improve teaching and learning process. Thank you very much for your readiness to participate fully.

1. What is your job position at this OUT Region Center? …………………………………………………..
2. Have you attended any distance education courses? ………………………….
3. What are the challenges facing ODL learners at this OUT regional center?

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

1. How do you assist students who are in rural areas to make sure they learn via ICT?

……………………………………………………………………………………………………………………………….

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1. What challenges do you face when assisting rural students and how do you saddress the challenges?
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* …………………………………………………………………………
* …………………………………………………………………………
1. What are the cost implications for rural students?

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1. Provide at least four suggestions for improving provision of distance education using ICT in your Region ………………..?

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