# FACTORS INFLUENCING THE USE OF INFORMATION TECHNOLOGY IN TELECENTRES IN THE RURAL SETTING OF KIAMBU COUNTY, KENYA

BY

NJERU JOB RINUS

# A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ARTS IN PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI

2014

# DECLARATION

This research project report is my original work and has not been presented for a degree in any other university or for any other award.

NJERU JOB RINUS

REG. NO: L50/76747/09

This research project report has been submitted for examination with my approval as University Supervisor

PROF: CHRISTOPHER GAKUO

DEPARTMENT OF EXTRA-MURAL STUDIES

UNIVERSITY OF NAIROBI

# DEDICATION

I dedicate this research project to my family members, wife Elizabeth Njeru, and parents Benson Njeru and Martha Warue Njeru for their love, support, patience and encouragement.

## ACKNOWLEDGEMENT

I hereby wish tothank my supervisor Professor Christopher Gakuu for his positive criticism on the document and guidance, without his help, guidance and dedication to support this research Proposal; I would not have been this successful.

I also acknowledge the support of the Lecturers Professor Macharia, Professor Kindombo Harriet, Engineer James Theuri, Levi Matseshe, Dr. Rambo Charles, Dr. Chris Wamalwa, BwiboAdieri, NaomiMutunga in the department of extra-mural studies, University of Nairobi, the administration staff especially Francis MvunguNyaga and ChrispinusKulenya and the whole University fraternity who have always been positive and supportive.

My appreciation also goes to my fellow classmates, James Otieno, Viola Kirongo, TeresiahMbugua, BrigidJuma and Mathew Simba for their assistance and moral support. I am grateful for their companyand positive discussions towards the achievement of my post graduate degree.

Special thanks go to my family members who realized the course of my study and gave me the moral support to complete my studies. I owe my success to their sacrifices.

Last and not least to God almighty for the gift of life and protection.

# TABLE OF CONTENT

# Page

DECLARATIONii	
DEDICATIONiii	
ACKNOWLEDGEMENTiv	
TABLE OF CONTENTv	
LIST OF TABLES	
ABBREVIATIONS AND ACRONYMSx	
ABSTRACTxi	
CHAPTER ONE	
INTRODUCTION	
1. Background of the Study	1
1.1.1 Kiambu County	5
1.2 Statement of the Problem	6
1.3 Purpose of the Study	7
1.4 Objectives of the Study	7
1.5 Research Questions	8
1.6 Significance of the Study	8
1.6.1 Telecentre Operators	8
1.6.2	8
1.7 Delimitations of the Study	9
1.8 Limitations of the Study	9
1.9 Assumptions of the study	. 10
1.10Definition of Significant Terms used in the Study	. 10
1.11 Organization of the Study	. 11
CHAPTER TWO	
LITERATURE REVIEW12	
2.1 Introduction	. 12
2.2 Empirical Review	. 12
2.3 Factors influencing use of ICT in Telecentre	. 16

2.4Theore	ical Review	21
2.4.1 Bo	ottom-up and Capacity Building Approach	22
2.4.2 Re	source Mobilization Theory	23
2.4.3Te	chnology Acceptance Model (TAM)	24
2.4.4	Conceptual Framework	25
CHAPTER	THREE	
RESEARCI	H METHODOLOGY	
3.1 Introdu	iction	28
3.2 Resear	ch Design	28
3.3 Target	Population	28
3.4 Sample	e Size and Sampling Technique	29
3.5 Data C	ollection Instruments and Procedures	30
3.6 Validit	y of the Research Instruments	31
3.7 Reliab	ility of the Research Instruments	31
3.8 Data A	nalysis and Presentation	32
3.9 Ethical	Consideration	33
	EQUID 25	
CHAPIER	FOUK	
ANALYSIS	, PRESENTATION INTERPRETATION AND DISCUSSION	
ANALYSIS 4.1 Introdu	POUR	35
ANALYSIS 4.1 Introdu 4.2 Respon	POUR	35 35
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backg	POUR	35 35 35
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgu 4.4 Staff Q	POUR	35 35 35 35
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgr 4.4 Staff Q 4.5 Location	FOUR    55      9, PRESENTATION INTERPRETATION AND DISCUSSION    35      action    5      inse Rate    5      cound Information    5      pualifications    5      on of Telecentres and Use of ICT    6	35 35 35 39 41
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgu 4.4 Staff Q 4.5 Location 4.6 ICT Fa	FOUR    55      9, PRESENTATION INTERPRETATION AND DISCUSSION    35      action    5      action    5      ase Rate    5      cound Information    5      pualifications    5      con of Telecentres and Use of ICT    6      acilities And Use of ICT    6	35 35 35 39 41 44
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgu 4.4 Staff Q 4.5 Locatio 4.6 ICT Fa 4.7 Produc	FOUR    55      9, PRESENTATION INTERPRETATION AND DISCUSSION    35      inction    5      inse Rate    5      inse Rate    5      inound Information    5      inpualifications    5      inclines And Use of ICT    6      inclines And Use of ICT in Telecentres    6	35 35 39 41 44 46
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backg 4.4 Staff Q 4.5 Locatio 4.6 ICT Fa 4.7 Produc 4.8 Regre	FOUR    55      9, PRESENTATION INTERPRETATION AND DISCUSSION    35      inction    5      inse Rate    5      inound Information    5      ingualifications    5      inclines And Use of ICT    6      inclines And Use of ICT in Telecentres    6      instant Analysis    5	35 35 39 41 44 46 50
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backg 4.4 Staff Q 4.5 Locatio 4.6 ICT Fa 4.7 Produc 4.8 Regre CHAPTER	FOUR    55      c, PRESENTATION INTERPRETATION AND DISCUSSION    35      inction    55      inste Rate    55      inste Rate    55      inound Information    55      inductions    55	35 35 39 41 44 46 50
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgr 4.4 Staff Q 4.5 Location 4.6 ICT Fa 4.7 Product 4.8 Regre CHAPTER SUMMARY	FOUR    35      9, PRESENTATION INTERPRETATION AND DISCUSSION    35      action    35      inse Rate    35      round Information    35      pualifications    35      point of Telecentres and Use of ICT    36      actilities And Use of ICT    36      actilities And Use of ICT in Telecentres    36      ssion Analysis    37      FIVE    53      X, CONCLUSION AND RECOMMENDATIONS    53	35 35 39 41 44 46 50
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgr 4.4 Staff Q 4.5 Location 4.6 ICT Fa 4.7 Product 4.8 Regre CHAPTER SUMMARY 5.1 Introdu	FOUR    35      c, PRESENTATION INTERPRETATION AND DISCUSSION    35      inction    35      inse Rate    35      incommutation    35      inclusion    35      inclintics    35      <	35 35 39 41 44 50 53
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgr 4.3 Backgr 4.4 Staff Q 4.5 Location 4.6 ICT Fa 4.7 Produc 4.8 Regre CHAPTER SUMMARY 5.1 Introdu 5.2 Summ	FOUR    35      9, PRESENTATION INTERPRETATION AND DISCUSSION    35      inction    35      inse Rate    35      inse Rate    35      inound Information    35      industry    36      industry    37      industry    38      industry    39      industry    39      industry    39      industry	35 35 39 41 46 50 53 53
ANALYSIS 4.1 Introdu 4.2 Respon 4.3 Backgr 4.3 Backgr 4.4 Staff Q 4.5 Locatio 4.6 ICT Fa 4.7 Produc 4.8 Regre CHAPTER SUMMARY 5.1 Introdu 5.2 Summ 5.3 Conclu	FOUR    35      c, PRESENTATION INTERPRETATION AND DISCUSSION    35      inction    35      inste Rate    35      instein of Telecentres and Use of ICT    36      instein Analysis    35      FIVE    53      instein Analysis    53      intion    53	35 35 39 41 44 50 53 53 53

5.5 Suggestions for Further Research	56
REFERENCES	. 57
APPENDICES	. 64
Appendix I: Letter of Transmittal	64
Appendix II: Questionnaire	65
Appendix II: Interview Guide	70

# LIST OF TABLES

Table 3.1 Operationalization Table of Variables	
Table 4.2 Level of Education	
Table 4.3 Age of the Respondents	
Table 4.4 Designation of Telecentre Staffs	
Table 4.4 Duration Worked in the Telecentre	
Table 4.5 Use of Telecentre Services	
Table 4.6 Telecentres Promote and Encourage Community Participation	
Table 4.7 Extent of Use of a Computer	
Table 4.8 Computer Skills and Use of ICT in the Telecentre	
Table 4.9 Location of Telecentres and Use of ICT	
Table 4.11 Facilities in the Telecentre	
Table 4.12 Facilities of Telecentres and Use of ICT	
Table 4.13 Facilities Availability and Use of ICT in the Telecentre	
Table 4.14 Services Offered in the Telecentres	
Table 4.15 Satisfaction with Quality of Services	
Table 4.16 Product Mix and Use of ICT in the Telecentres	
Table 4.17 Product Mix and the Use of ICT	
Table 4.18 Model Summary	
Table 4.19 ANOVA Results	
Table 4.20 Coefficients Results	

# LIST OF FIGURES

Figure 2.1	Conceptual	Framework	 	 26
0	1			

# ABBREVIATIONS AND ACRONYMS

ACWICT	African Centre For Women & ICT
BPO	Business solution center
CSR	Corporate Social Responsibility
DVP	Digital Villages Project
EUC	End User Computing
ICT	Information and Communication Technology
ID	Identification Card
IDRC	International Development Research Centre
IT	Information Technology
ТАМ	Technology Acceptance Model
UCRC	Ugunja Community Resource Centre
UNESCO	United Nations Educational, Scientific and Cultural Organization
USD	United States Dollar

## ABSTRACT

Most telecentres in Kenya and specifically in Kiambu County have not adopted ICT. This is despite the government investment in ICT recognition that telecommunication, information services, and IT sectors are important for economic growth. The purpose of this study was to investigate the factors influencing the use of information technology in telecentres in rural setting of Kiambu County, Kenya. The study sought to establish whether qualification of staff, existing ICT infrastructures, location of the telecentres and product mix offered by the telecentresinfluence the use of information technology in telecentres in Kiambu County. The study employed descriptive research design. The target population of the study was 20leaders and staff in the telecentresin Kiambu County and 10,000 community members who are the users of the telecentres. The study adoptedFischer formula to calculate the sample size whereby a sample size 384 community members and 20 telecentre leaders formed the sample size. The study adopted purposive or judgmental sampling to select the respondents. Primary data was collected through the use of both the questionnaire and the interview guide. The researcher personally administered the questionnaires through the use of data collection assistants. The data was analyzed through both descriptive and inferential statistics. The descriptive statistics included frequency distribution tables and measures of central tendency (the mean), measures of variability (standard deviation) and measures of relative frequencies while inferential statistics involved the use of linear regression model to test the form of relationship between the variables. The analysis was aided by the SPSS software. The analyzed data was presented in tables and charts. The study found out that there was a significant relationship between the use of ICT in telecentres and qualification of the staff, infrastructure, location of the telecentres and product mix. The study concludes that staff qualifications and especially computer skills affect use of ICT in the telecentre.Location of the telecentre affects its access to convenient connection with electricity and internet. Inadequate facilitiessuch as computers, power, photocopiers, scanners, laminators and printers, lack of enough chairs and space, as well as unreliable internet affected the use of ICT in the telecentres to a great extent. The variety of product and services offered in the telecentres varied and they also influenced greatly on the use of ICT. The study recommends that there is need to employ qualified and competent staffs with adequate qualifications and experience so as have a significant contribution in the adoption and use of ICT in the telecentres. It is essential for the government and the local authorities to provide critical facilities and infrastructure in the telecentres that fits local needs and so as to ensure that the community accesses appropriate service in the telecentres and also offer supportive learning environment.

#### **CHAPTER ONE**

## **INTRODUCTION**

## 1. Background of the Study

Information and Communication Technologies (ICT) can be described as a variety of goods, applications and services. That can be used for creating, disseminating, processing and transforming information(Marcelle, 2000). The use of ICT can accelerate and enhance the dissemination and sharing of information and facilitates the communication processes, across vast, geographically dispersed areas (Meng, Samah& Omar, 2013).

ICT is a means to an end, and not an end in itself, as it works as a tool and enabler to accelerate development. The value created via ICT is to aid the different sectors in using technology to disseminate information and knowledge and improve accessibility. Thus, solely depending on investment and use of ICT is not a solution to economic growth. Telecentres are seen as the starting point from which the government can achieve the transformation of the country into a knowledge-based economy and a knowledge-society, while encouraging the usage of ICT services in people everyday lives (Meng, Samah& Omar, 2013).

In recent years, most developing countries have witnessed the emergence of Local information and communication centers commonly referred to as telecentres. These centers emerged or were established with the objectives of bridging the digital divide between the urban and rural populace and also to bring the benefit of information and communication technology to the poor. As such, governments in developing countries identified and adopted the establishment oftelecentres not just as a mechanism, but also as a strategy for rapid rural community development through bridging digital divide that exists between rural and urban areas or communities, and for improving the living conditions of people living in rural communities. For example in India, majority of the telecentre projects established were done

to provide information, communication and other related ICT services to the rural communities (Bashir, Samah, Emby, Badsar, Shaffril&Aliyu, 2011).

According to a recent report by The World Bank Group (2012), ICT can effectively be used for overcoming poverty, increasing business productivity, accelerating economic growth and improving accountability and governance in any society. Thioune (2003) emphasizes that ICT plays an important role in improving different aspects of peoples lives. For example the use of ICT could positively impact on economic growth, education, communication, and mobility, as well as providing opportunities for positive development. In sub-Saharan African countries such as Mozambique, Uganda, and South Africa, Kenyatelecentres were established with the aim of providing their rural communities with the ability to make use of ICT for their economic and social development (Harris, 2001).

Telecentres have been introduced to many communities throughout the developing world. Significant examples include the Acacia project that aims to empower sub-Saharan African communities with the ability to apply information and communication technologies to their own social and economic development. Acacia works in Mozambique, Senegal, South Africa, and Uganda, mainly with rural and disadvantaged communities, which often find themselves isolated from the ICT networks to which their urban counterparts increasingly have access(IDRC,http://www.idrc.ca/research/ xacacia\_e.html).

Based on existing literature, no single definition of telecentre success is generally acceptable. This is because the term telecentre success has been used by different people to mean different things. For instance, Colle (2005) defined telecentre success as the degree to which the telecentre is strongly accepted by the communities. According to this definition, once the telecentre project is strongly accepted by the people in communities it is successful. OgNeil (2002) defined telecentre success as desirable outcomes such as revitalizing sense of community, enhancing social capital, empowering members of the community, enhancing strong democracy and providing economic opportunities.

Telecentres are set up to enable various community welfare schemes by adapting information technology to deliver focused deployments of ICTs in pursuit of development goals. Telecentres may offer a range of services, including telephone, training for ICT literacy, local access to online government information and services, the possibility of partnerships with community welfare schemes in health and education, and sometimes even support for commercial activity. Beyond the issue of connectivity, telecentres provide an opportunity for accessing and using appropriate digital technologies to solve problems and assist developmental activities. For instance, by supporting the community development, educational, health and social development so as to bridge the digital divide(Bashir, et al, 2011).

The telecentre vision emphasizes communal good over individual gain and collective or patron-driven process over private ownership of means. It measures success based on impact in the community rather than on private parties. However, concerns such as enterprise sustainability and viability are often ignored (Bashir, et al, 2011) .According to Farr andPapandrea (2006), to achieve social sustainability, the aim should be creating a centre that promotes and encourages equitable, collaborative and open participation that enhances community development.

In terms of social sustainability of community technology telecentre, Day (2005) argued that social sustainability ultimately would be determined by communities themselves. Therefore, beside the technological and infrastructure requirement, social sustainability of the project after period of time needs to be addressed. There are a number of factors such as quality of services and delivery, appropriate staffing, and effective promotions of telecentres which are

crucial in achieving social sustainability of telecentres (Zahurin, Huda, Khairudin, Nor Iadah, Affendi&Zulkhairi, 2009).

In Kenya, telecentres include: African Centre For Women & ICT (ACWICT), Cura Village information centre, KAIPPG, Kikambala Primary School learning Resource Centre, Slum Information Development And Resource Centre (SIDAREC), Ugunja Community Resource Centre (UCRC), Asembo Bay Women Group, Bar Korwa Resource Centre, Computer Animation and Web Design (CAWD) Regional Coordinator, Chelingwa School Resource Centre, Kcomnet- Kenya Community Media Network, Kimathi Information Centre among others. The typical services offered these telecentres include: basic internet services (email services, research and information resource generation); secretarial/ business services (typesetting, scanning, printing, copying and faxing, public calling center, ID printing & lamination); ICT services (troubleshooting, computer repair, technical services, and web development); Internet Service Provider (provision of Internet connectivity to local government units, schools, barangays and households); conduct for eGovernment services (Regforms, P3 forms, applications for ID and passport etc.); eBusiness (eBanking, eTrade); Public eLibrary; and Business solution center (BPO)

The Kenyan government, together with external stakeholders and private contractors, is increasing its ICT investments in order to reach the entire population regardless of demographic factors, whereas the *Digital Villages Project (DVP)* is one of the largest efforts. Digital villages are referred to as *Pasha Centres*, meaning õto informö, and are located in rural and resource-poor environments. In the Kenyan context, digital villages are what normally other countries, e.g. in Sri Lanka and India, refer to as telecentres (e.g. Hansson, Mozelius, Gaiani&Meegammana, 2010). A telecentre in Kenya however, normally refers to what Jensen and Esterhuysen (2001) defines as micro and mini telecentres. Therefore, a digital village in Kenya has a similar role as a telecentre in many other countries, i.e. to

provide services with regard to Internet and telecommunication. In addition, digital villages are also meant to provide certain training, education, and governmental services (e-Government). In this respect, it is a challenge for the Kenyan Government to meet the needs of a population, which are diverse in terms of demography and sociocultural background (GoK, 2009).

#### 1.1.1 Kiambu County

Kiambu County is a county in the former Central Province of Kenya. Its capital is Kiambu and its largest town is Thika. The county is adjacent to the northern border of Nairobi County and has a population of 1,623,282 (Kenya Census, 2009). The county is predominantly rural, but its urban population is increasing as Nairobi is growing rapidly. Kiambu County is subdivided into 11 sub counties Limuru, Lari, Kikuyu, Gatundu, Githunguri, Thika East, Thika west, Ruiru, Kiambaa, Gatanga and Karuri

The main economic activity in the county is agriculture- tea, coffee, dairy, poultry and horticulture. Kiambuøs major urban centers are Thika, Ruiru, Gatundu, Limuru, Kabete, Githunguri, Kiambaa, Kikuyu, Kiambu, Lari and Karuri. Although the county is rural, its urban population is increasing as Nairobi grows rapidly.

Telecentres in Kiambu county are scattered in all the sub counties in the county. Most are centres are found next to the small market towns found in the rural parts of the county.Most are initiatives of youth groups and community based organizations whose main endeavor is to bring services close to the people.in every rural market there is usually one or two operational telecentres.

## 1.2 Statement of the Problem

Rural regions usually are remote areas that frequently are considered as information-poor in which providing information has been a central factor for their development. The power of knowledge for development can be greatly enhanced by ICT through improving the access and breaking down the barriers to knowledge and information exchange (Slaymaker, 2002); and by facilitating knowledge management (Rao, 2009). Telecentres as a kind of ICT projects are providing the benefits of new communication technologies to the rural poor (Roman, 2003). However, the lack of sustainability as a common problem for many telecentres hinder them from staying operational in a successful way for long run and becoming independent from subsidies and external supports (Jauernig, 2003).

The Kenyan government strives to recognize peopleøs everyday lives in this effort and creates better conditions of living. These thoughts are in line with the philosophy of *lifelong learning* (ebrary, 2003; UNESCO, 2009). For the telecentres and the Digital Villages Project to be successful it is important to take into account the advantage of ICTs to enable the remote populations to enjoy the benefits of commerce, education, and health services (Lallement, Terrado& Zhang, 2006).

Most telecentres in Kenya and specifically in Kiambu County have not adopted ICT. This is despite the government recognition in the Kenya's Poverty Reduction Strategy Paper for the period 2001-2003, that telecommunication, information services, and IT sectors are important for economic growth. According to Rogers and Shukla, (2001) one strategy for bridging the digital divide within a nation, and between nations, is to encourage telecenters. But this cannot be achieved unless the telecentes adopt ICT in their operations. A review of local studies shows that Muinde, (2009) investigated the factors affecting the adoption of information and communication technologies for communication of research output in research institutions in Kenya. The study found out that socio-cultural factors as well as

institutional factorsaffected the adoption of information and communication technologies. Hallberg, Kulecho, Kulecho, Okoth (2011) did case studies of Kenyan digital villages with a focus on women and girls. They concluded that there is need for the Kenyan government to consider the literacy and language issues are discussed when setting up digital villages as it will ensure that all citizens feel included and accept the use of digital villages. Mucheru (2013) conducted a study on the factors influencing adoption of information systems in private healthcarefacilities in Kiambu County. This shows that empirical evidence on the factors influencing the use of information technology in Telecentresin Kenya remains unexplored. It is against this background therefore that the study seeks to establish the factors influencing the use of information technology in Telecentres in Kiambu County, Kenya.

## **1.3 Purpose of the Study**

The purpose of this study was to investigate the factors influencing the use of information technology in telecentres in Kiambu County, Kenya.

#### **1.4 Objectives of the Study**

The study was guided by the following objectives:

- To examine how qualification of staff influence the use of information technology intelecentres in Kiambu County
- To examine the extent to which the existing ICT infrastructures influence the use of information technology intelecentres in Kiambu County
- To establish the extent to which the location of the telecentres influence the use of information technology.
- 4. To determine the extent to which product mix offered by the telecentresinfluences the use of information technology.

# **1.5 Research Questions**

The study sought to answer the following research questions:

- How does qualification of staff influence the use of information technology in telecentres in Kiambu County?
- 2. To what extent does the existing ICT infrastructure influence the use of information technology in telecentres in Kiambu County?
- 3. How does the location of the telecentresin KiambuCounty influence the use of information technology?
- 4. To what extent does the product mix offered by the telecentres in Kiambu County influence the use of information technology?

## **1.6 Significance of the Study**

The study wasof value to the following:

#### **1.6.1 TelecentreOperators**

The research could provide information that couldhelp telecentre operators to make changes that could help them achieve their goals. This study is expected to be of significance to the management and leaders of these projects in the area of the study and beyond as it highlights the critical factors necessary to promote usage of information technology and sustainability oftelecentres at large.

## **1.6.2Government Agencies and Financiers**

The findings could also be shared with the government agencies to enable them make informed decision while planning for development projectssuch as the telecentresin the community as well as community led projects. The information gathered could loo be very useful to the financiers of the projects to determine whether their funds are being channeled to worthy causes. The major financiers are the government and non-governmental organizations.

## **1.6.3 Scholars and Researchers**

The study could provide invaluable information to scholars and researchers. The study was expected toidentify and generate interest for future research. The study also acted as a basis for further research in area of the study.

#### **1.7 Delimitations of the Study**

The study was limited to telecentres in the Kiambu County. The researcher utilized his time well to ensure that he met all the objectives set on time. He also ensured that he explained the purpose of the study to the respondents to gain their confidence and trust to the respondents willing to participate in the study.

The study targeted the telecentres leaders as well as the community who use the services in those telecentres. Both primary and secondary data was collected; whereby, secondary data was collected from journals, books and articles while the primary data was collected from the target respondents.

#### **1.8 Limitations of the Study**

One key limitation that was encountered in this study includes failure of some of the respondents to truly answer to the questions as required or answer them to suit their needs. In some cases the leaders and management teams of the telecentreswerenot willing to give the expected information. However, the researcher explained to the respondents the purpose of the study, ensured the respondents confidentiality and sought permission from the relevant authorities which gave the respondents confidence to be part of the study.

Due to nature of this research, the researcher could not know the right community members/ users of the telecentres that would give the most reliable, up to date and credible information in regard to the factors influencing the use of information technology in the telecentres in the KiambuCounty. However, to overcome this challenge, the researcher used judgmental sampling whereby the researcher selected respondents found seeking services at the telecentres during the time of the research and also asked for referrals to other community members you regularly usetelecentre in the area.

#### **1.9 Assumptions of the study**

The assumption made is that there was peace during the entire process of the study and the respondents of the study answered the questions accurately, honestly and truthfully to the best of their knowledge. The research tool wasadequate in collecting data for the desired objectives of the research.

# 1.10Definition of Significant Terms used in the Study

**Information Technology**-Information technology is defined as capabilities offered to organizations by computers, softwareapplications, and telecommunications to deliver data, information, and knowledge to individuals and processes.

**ICT Infrastructure**-These area range of technologies to assist organisations in running efficiently; they are essential to the everyday mechanics of an organisation and integral to effective service delivery. These include hardware, software, networking and implementation.

**Product Mix-** It means the range of products and services offered in the telecentres which may includeICT products and traditional ICT-related products and services.

**Rural Centresof Kiambu**- These are centres in Kiambu rural areas or in villages that are meant to provide certain training, education, and governmental services.

**Resource mobilization-** is the ability to acquire resources and to mobilize/utilize them towards accomplishing the projects goals; is actually a process of raising different types of support for an organization/project.

**Staff qualifications**- It means the capacity, knowledge, or skill that suits or makes someone eligible to handle an a certain assignment.

**Telecentre** - A public place where people can access computers, Internet, and other digital technologies that enable them to gather information, create, learn, and communicate with others while they develop essential digital skills.

# 1.11 Organization of the Study

In this first chapter, it entails the introduction and the background information on the telecentres and use of ICT. It also covers the statement of the problem which forms the launch pad from which the research sprouts. Chapter two covers literature review which includes the theoretical review, discusses historical studies in the global, regional and local perspective, relevant to the field under study and further presents the conceptual framework which shows the relationship between variables in the study. The study ends with a section on the identified research gaps and the summary of the chapter. Chapter three details the methodology used to achieve the objective of the study. This section highlights the research design, target population, sample design, data collection instruments and procedures, validity and reliability of the study and lastly the proposed analysis technique and presentation of the data. Chapter four entails the findings of the study based on the study objectives. This includes the data analysis, interpretation and the presentation of the findings. Chapter five synthesizes the entire project and contains the summary of findings; conclusions arrived at, policy recommendations and recommendations for further studies.

#### **CHAPTER TWO**

# LITERATURE REVIEW

## 2.1 Introduction

This chapter first represents the empirical review of what other researchers have done in similar studies, then theoretical review of the study; in this section, theories guiding the study are discussed. It further looks at the conceptual review whereby, relationships between variables that are used in this study and presents a conceptual framework. It finally gives a summary of the entire chapter.

#### 2.2 Empirical Review

This section discusses findings from empirical studies that have been conducted by other researchers in seeking to establish the relationship between various underlined factors and the use of ICT in telecentres.

According to Badsar, Samah, Hassan, Osman and Shaffri(2011), the quality and availability of services need to be placed as a top priority in developing telecentres. The main factors for infrastructure sustainability are: connectivity, stability, business continuity, demand-oriented infrastructure, perceived centre security and insurance, maintenance and supply of IT equipment. Internet accessibility and connection is key enabler for remote areas for accessing information from the global information network, therefore, poor telephone lines and poorly maintained infrastructure and electricity supply should be avoided. Roman and Colle (2002) argue that many ICT projects have been initiated without a firm plan for long-term sustainability. Therefore, some of the available telecentres might not have the appropriate recourses to maintain their IT equipment.

Norizan (2009) identified community participation, involvement and support as one of the key factors that could contribute with narrowing the digital gap in telecentres. Through the strong support from the community, users, committee members, and the local champion (e.g. local leaders, politicians or state representatives) any decisions made could be successfully implemented by the telecentres operators. Community involvement could also ensure that planned ICT activities are carried out and encourage people to participate in such activities.

Raoøs (2008) study shows that in India community involvement enhanced the telecentresø sustainability and success. Moreover, Kanungo (2004) indicates that collective ownership of a telecentre could ensure access to everyone regardless of social status. He also affirms that the leadership and participation on telecentres is crucial in ensuring different and innovative ideas with respect to narrowing the gaps. Roman and Colle (2002) also emphasizes the important of community participation in telecentre projects: õit conveys a sense of community ownership it provides indigenous wisdom; it helps reflect community values and will help us identify information needs; it provides important resources, such as volunteers or technical expertise, at a favorable cost; and some people need the telecentreøs servicesö (p.12). Similarly, Roman and Colle (2002) state that in order to create a successful telecentre, community partnerships and participation, as well as community relevance should be considered.

Roman and Colle (2002) argue that one of the universal barriers to access ICT services is illiteracy; communities will face limitations in accessing ICT services and training programmes if they are illiterate. The content of the services and programmes on offer need to be relevant to the local context. In addition, learning or using new technology might cause anxiety or fear for some members of the population, and this technophobia results in hindering the broad use of ICT.

Colle, (2002) also revealed that the projects should be relevant to the community needs and interests; it is essential to carefully tailor and maintain an infrastructure that fits local needs and offers a supportive learning environment that enables engagement and empowerment that in turn are instrumental in achieving a knowledge-based economy.

Qualified staff and managers are essential forthe development of telecentres and integrating ICT into the programmes. Badsar, Samah, Hassan, Osman and Shaffri(2011) show that competency of leaders with adequate qualifications and experience contributes significantly to telecentresø success. Leadersø competency and capacity to manage telecentreseffectively, and their ability to ensure that the infrastructure functions adequately, are vital factors in the success of developing telecentres.

A study conducted by Norizan, Zaharah and Rosseni(2010) on the effectiveness of the training programs offered at the telecentre shows that a standard training program and evaluation procedures are needed. The study also reported that training in ICT related skills, development strategies, staff roles, production of content, marketing, evaluation, human resource management are important components in ensuring the sustainability of the telecentre. Roman and Colle (2002), point out that most emphasize has been posited on computer-related skills.

According to Ariyabandu (2009), poor level of involvement of governments and communities in telecentresø can impede the adoption and the usage of ICT; since it limits creativity and innovative thinking. Colle (2005) states community organizations such as health centers, agricultural extension agents etc. should build partnership with telecentres and join efforts in identifying the needs of the communities so that they can satisfy the demand for telecentre services. In addition, telecentre staff should be able to reach out to local community groups and demonstrate how telecentre resources can be applied to business, government and development of activities. For example, in China and Hungary telecentres have successfully established links with local government or private organizations resulting in the enhancement of telecentres sustainability (Colle, 2005).

According to Ibrahim, Yasin and Dahalin(2010), financial support is the key element for operating and maintaining telecentres. Telecentres are generally dependent on public funds at least in their initial stages. Ibrahim, Yasin and Dahalin (2010) show that more than three quarters of the telecentres in Malaysia are given inadequate budgets, hence hindering the extent to which they can deliver benefits and services to the marginalized society. According to Norizan&Jalaluddin, (2008) telecentrefinance must be carefully planned and should be invested in creative ways. Previous studies have confirmed that a lack of financial support has caused many telecentres to face problems which include adoption of ICT.

According to available empirical data on telecentreprojects that operate in different countries there are 10 major factors related to telecentre sustainability and adoption of information technology (Roman &Colle, 2002). These are: Commitment from policy makers; transforming policy into action; hiring suitable and influential persons who are capable of encouraging others to understand the objectives of telecentres; engaging volunteers to operate the telecentres; fosteringcooperation between telecentres, as this can help them to advance and share a variety of resources; raising awareness of the importance of ICT as a source of information in this modern day; conducting research relevant to telecentres; focusing on information services that fit community interests, with a larger base for generating income; and encouraging community involvement via a strategic approach.

15

#### 2.3 Factors influencing use of ICT in Telecentre

According to Apulu and Latham (2009), in order to facilitate the successful implementation of information system in organizations, and to avoid adoption failure, the businesses should provide employees with computer education and training courses. IT acceptance among users of IT who form part of a firm employeeøs base will impose positive impacts on IT adoption.

A study by Mucheru (2013) revealed that three factors; Staff ICT literacy, information systems characteristics and top management characteristics significantly influences adoption of information systems in healthcare service delivery. One factor the external pressure was found to have no significant influence on the adoption of information system.

Roman and Colle (2002) also argue that one of the universal barriers to access ICT services is illiteracy; communities face limitations in accessing ICT services and training programmes if they are illiterate.Badsar, Samah, Hassan, Osman and Shaffri (2011) also revealed that technology infrastructures are important facilities and equipments to be used in telecentres and are means ofbuilding a knowledgeable society.Norizan (2009) also identified community involvement as one of the key factors that could contribute with narrowing the digital gap in community towards telecentres. These factors identified by the above research studies can hopefully provide substantial help guidance to this study.

#### 2.3.1 Qualification of Staff and Use of ICT in Telecentre

This is an important factor which according to many scholars or researchers influences telecentre success. Leaders of telecentres need to have certain level of competency and experiences in order to manage the telecentres effectively so as to enable them achieve their objectives. As Hunt (2001) suggests, qualified and well trained leaders, employees, volunteers and skilled in technical support should be employed to run the affairs of

telecentres. This according to him is because, without well trained leaders and staff, assisting users to use ICT and conducting activities in the centre cannot be possible.

Similarly Benjamin (2000) in his opening remarks at ICT international conference emphasized the importance and need for competent leadership to be engaged in telecentres. He further stated that community projects like telecentres need leaders who are competent, trained and adequate community support in order for them to be successful and sustainable.Moreover, it has been argued that in most cases, the success or failure of telecentres is determined by the skills and characteristics of the leaders (Rothschild, 2008).

According to Mphalele and Maisela (2003), and Bahaman et, al. (2010), sound management and administrative skills are very crucial to the success of telecentres. While Colle, (2005), asserts that leadership, management quality and flexible leadership, ensures the success and sustainability of telecentres. Abdul Razak (2009) claimed that there is positive correlation between the personality of leaders and telecentre success, as they are charged with the responsibility of managing the activities in the telecentres. Based on available literatures we can say that competency of leaders is an important factor that leads to telecentre success.

#### **2.3.2InfrastructureandUse of ICT in Telecentre**

Infrastructures are facilities and/or equipments that are required by any telecentre to function adequately. They includes: Computer sets, printer, photocopier, fax machine, internet connectivity, power back up and others. According to AdulRazak (2009), for telecentres to be successful and serve as an agent of developing knowledgeable society, they should be (1) well equipped with computers both for community and telecentre operators, (2) the computers should be regularly up-dated to meet up with the latest software in the market and ensure that they can be used for online purposes, (3) the telecentre should be equipped with Wireless Fidelity (WI-FI) for those who want to use their personal laptops or computers,

especially when the commuters in the telecentres are fully occupied (4) special arrangements should be made for disabled groups by providing assistive facilities.

The author further claimed that if these are achieved, the telecentres will function effectively and serve as effective agents for community to have access to knowledge and achieve desirable outcomes. It has been observed that lack of constant power supply, and affordable and stable connectivity as well as difficulties in maintaining the telecentreequipments are the most common problems affecting telecentres success (Fillip and Foote, 2007).

They assert that the unstable power supply causes serious impediments to the telecentre such as, loss of revenue, paralyze activities in telecentre and early break down of computer equipments which affect the success and long term sustainability of the telecentre. Also, Gichoya (2005), in his work claimed that lack of infrastructures as one of the factors affecting implementation of ICT projects. In line with this, Islam and Hassan (2008) also argued that lack of reliable communications infrastructures and inadequate bandwidth is also a factor affecting the take up services in the telecentres.

According to Gyamfi (2005), poor quality infrastructures and complete absence of infrastructures@(such as electricity) and cost of connectivity created barriers to information, making it difficult for people to use ICT services in many Sub-Saharan countries. In Ghana for example, majority of the rural communities have no constant electricity supply as a result the telecentres cannot function effectively (Alemna and Joelm, 2006). In Dhar village in rural India, lack of basic infrastructure such as power supply and poor connectivity prevent telecentre from providing effective services (Conroy, 2006).

These paralyzed activities in the centres and prevent people from enjoying the benefits of the ICT projects. Consequently, Caroline, Brenda and David(2006), suggested that availability of infrastructures and other items such as spare parts, hardwires, and soft wareøs and their

regular supplies in telecentres, need to be maintained in order to keep them functioning and maintain the support and interest of the community.

#### 2.3.3 LocationandUse of ICT in Telecentre

Yusop, Muhd, Kasiran and AjiandZulkhairi (2009) and Abdul Razak (2005) in their study claimed that location is an important factor that can lead to the success of a telecentre. Bailey and Ngwenyama (2009) in their model of telecentre success explained that the location of a telecentre plays a very important role in determining their usage, which in turn leads to their success. Also, they argued that the location of a telecentre and its operating environment determines the extent with which telecentresø services and facilities are utilized. Conradie and Jacob (2003) also posit that the location of a telecentre is an important factor which contributes to the success of the telecentre.

Islam and Hassan (2009), in their own part, argued that location of atelecentres is very important and therefore, they should be in a place where people frequently visit and where they can easily gain access to. Scott (2001), quoted Scharffenberger (1990) who held the opinion that the location of a telecentre can sometimes be a threat to the potential users, a fact that he also links to Richardson, Ricardo and Moinul(2000) recommendation that village telephones in rural Bangladesh should be located in places that can encourage wider access for both men and women users but not a place where it can be difficult for women to access the services. For instance, study have shown that one of the reasons why telecentre in Thiruvadauur village, a rural community in India was not successful despite all efforts made by the operators, was because it is located far away from the community (Kumar and Best, 2000).

Similarly, Joseph and Andrew (2007) in their study observed that the location of an Internet Kiosk in Africa is one of the major problem that prevented people especially women from getting access to the use of internet. In most cases the kiosks are located far away from the communities, and as result the women felt discouraged to visit the centre as they have to pay high amount to get to the centre. According to Scott (2001), Holmes (1999) and Robinson (1998) suggest that telecentres should be located in a place known by the community as a stable place such as schools, libraries, museums, and other similar places. This will leads to success, attract more users and minimize the cost of on them.

According to Young and Gail (2001), location of telecentres in already existing places in Tanzania, such as library and other similar places saved each telecentre between USD \$7800 and \$10,400 per year. This according Young, et, al. (2001) were money that would have otherwise been spent to pay for rent, secure accommodation, provide communication facilities or electricity supply. Moreover, the location of telecentres, in already existing places is also not only minimizing the expenses of telecentres, but also attracts more revenue to the centres. This is supported by Mphelele and Maisela (2003) views that the telecentres that generate more revenue are those located in strategic places such as schools, close to the shops, Taxi rank, and other public places.

#### **2.3.4 Product Mix and Use of ICT in Telecentres**

The product mix that is offered by the telecentre is likely to influence its adoption by the host, this should be sensitive to community requirements. The closer the software tools match the needs of the community, the more likely they will be used. Telecentre financing is critical to viability and sustainability. The quality and responsiveness of management planning for maintaining suitable levels of products is important as well as the extent to which a telecentre is able to effectively network with other centres in order to share experiences, cross- fertilise ideas and promote joint learning (Harris, 2001).

According to Comolli (2008), a telecentre network can help telecentres to expand their range of products beyond the traditional ICT-related ones, such as ICT technical support and training, to include health, e-government, and educational related products and services, for example. Using a proper distribution strategy, a telecentre network can offer products that come from national and international entities; and act as a distribution channel of content and services. This implies working with private sector companies, civil society organizations and governments to distribute, implement, test and demonstrate products or services. Telecentes can obtain significant resources this way. It gives networks an opportunity to expand the range of products and services they offer beyond the traditional ICT-related ones.

Since telecentre networks support and interact with a large number of telecentres (sometimes numbering in the hundreds or even thousands), the type of social enterprise that strikes a better balance may be one that provides new product or services to the existing clients (that is, member telecentres) (Harris et a; (2003). At any rate, a rigorous analysis of telecentres objectives, telecentre needs, revenue streams and resource mobilization possibilities is always required. The most appealing scenario, in most cases, is one where both networks and telecentres generate some revenue, offering products that offer greater value added at the community level (Comolli, 2008).

# **2.4Theoretical Review**

This section discusses the theories that are attributed by other researchers, authors and scholars and are critical in guiding the study. This study was guided by bottom-up and capacity building approach, resource mobilization theory and technology acceptance model (TAM).Lastly, is the conceptualization which is a framework that shows the relationship between the dependent and the independent variables.

# 2.4.1 Bottom-up and Capacity Building Approach

The bottom-up approach in community development was developed by Finger (1994). According to Finger (1994), the õbottom-up approachö in community development would likely bring about empowerment to the community and finally sustainable community development. The approach emphasizes community participation, grassroots movements and local decision making. The theory states that community participation and grassroots initiatives promote participatory decision making and local self-reliance (Panda 2007). The people are able to define their own problems and having ability and capacity to solve it through organizing and participating themselves. Since the 1990s, institutions have addressed the issues of sustainability, participation and empowerment. These issues have been researched and debated by donor agencies, NGOs, feminists, and activists (Johnson and Rogaly 1997; Razavi 1997; Kabeer 1999; Mayoux 2001; Mahmud 2003).

Capacity building is another community development strategy that helps to have sustainable community development. Capacity building is an approach to development that builds independence (Frankish 2003). Before beginning to build capacity within programs, practitioners need to identify pre-existing capacities such as skills, structures, partnerships and resources. Frankish (2003) has counted a number of dimensions for community capacity including financial capacity (resources, opportunities and knowledge), human resources (skills, motivations, confidence, and relational abilities and trust) and social resources (networks, participation structures, shared trust and bonding).

UNDP (1997) introduced capacity building as the process by which individuals, groups, and organizations increase their abilities to perform core functions, solve problems, define and achieve objectives; and understand and deal with their development needs in a broad context and in a sustainable manner. Langran (2002) has defined capacity building as the ability of one group to strengthen the development abilities of another group (local communities)

through education, skill training and organizational support. There is a need to work across the key action areas, each situation separately to identify pre-existing capacities and develop strategies specific to a program or organization, in its time and place. Community empowerment through the provision of education, skill and knowledge, develop the capacity of community towards achieving sustainable development. Empowerment acts as a capacity builder to help the awareness, motivating to participation in project and finally improving the quality of community slives.

#### **2.4.2 Resource Mobilization Theory**

Resource mobilization theory (RMT) developed during the 1970s as a new generation of scholars sought to understand the emergence, significance, and effects of the socialmovements of the 1960s (Jenkins 1983;McAdam, McCarthy, &Zald 1988; Edwards &McCarthy 2004). Resource mobilization theory states that Mobilization is "the process of forming crowds, groups, associations, and organizations for the pursuit of collective goals" (Oberschall quoted in Scott (1998). Organizations do not "spontaneously emerge" but require the mobilization of resources. It stresses the ability of movement's members to acquire resources and to mobilize people towards the furtherance of their goals (Kendall, 2006).

According to Rengasamy (2009) resources are required in community developments projects; key among the resources is  $\exists$ moneyø as the most important without finance/ money one cannot activate the other resources in the community. Market oriented economy like in Kenya; monetary resource determines the expansion or contraction of other resources. The success of any community organization agency lies in its ability to raise enough funds (monetary resources), and convert other locally available resources in such a way that it can be exchanged for the money or to plan its activities into the projects.

Traditionally -Alms Givingø and charity was held a high and respected place, the persons who were concerned with community affairs, were able to collect the necessary funds from the wealthy people. Presently the motives behind giving charity as well as the dimensions of the community problems have changed because of corporate social responsibility (CSR) of large firms. The resultant effect is that the resources are drying up for community projects. At the same time more money is required for welfare services in organizations changing needs and adopting better methods of helping the people. Rengasamy (2009) points out that either the state aid is to be increased or the agencies have to depend largely upon the community *s* support in sound economies. It is not possible to increase support from the Government. This necessitates a change in approach and towards suitable ways of mobilizing resources from the public, without expecting a lot from the government agencies and other development partners. Resources are the inputs that are used in the activities of a program. The term encompasses natural, physical, financial, human, and social resources, but the vast majority of the resources are financial resources. Other resources such as the provision of office space, seconded staff, or partner participation at board meetings are a second level of resources. According to Kendall (2006), grievances are not enough to lead to the creation of a community movement, and instead that access to and control over resources is the most important factor. He states that the flow or resources from and towards the group can be best explained by the laws of supply and demand, and that individual or group involvement.

# 2.4.3Technology Acceptance Model (TAM)

TAM is one of the most influential extensions of Ajzen and Fishbeinøs theory of reasoned action (TRA) in the literature (Fishbein and Ajzen, 1975; Ajzen, 1985). It was developed by Fred Davis and Richard Bagozzi (Davis 1989, Bagozzi, Davis &Warshaw 1992). The theory states that the acceptance of a technology places less emphasis on end user computing satisfaction as a surrogate measure for end user computing success. Instead, acceptance or

usage of the technology (microcomputers) by users becomes the dependent variable, and is used an indicator of end user computing success.

Harris (1999) found that attitudes toward microcomputers were the most immediate determinant of microcomputer usage. The study by Igbaria, Guimares and Davis (1995) confirmed the effects of external variables in the TAM onusers' beliefs. Individual characteristics, organisational and system characteristics, were all found to influence the users' perceptions of the ease of use of microcomputers as well as their perceived usefulness. The model synthesizes a range of factors said to lead to positive outcomes as a result of deploying End User Computing (EUC) technology. They are suggested to arise from a combination of factors relating to the individual userøs characteristics, the application system in use and the organization in which it is being used. In the Diffusion Theory, Rogersø categories the five stages (steps) as: awareness, interest, evaluation, trial, and adoption. It should be noted that an individual might reject an innovation at anytime during or after the adoption process. In later editions of the Diffusion of Innovations Rogersø changes the terminology of the five stages to: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 2003).

#### 2.4.4 Conceptual Framework

Figure 2:1 below presents the conceptual model developed out of a critical review of existing literature on the variables. The conceptualization in this study was based on the following variables: use of information technology in telecentres(dependent variable); and qualification of the staff/leaders, existing infrastructure, location of the telecentres, Product mix (independent variables).Perceived Ease of Use and Perceived Usefulness are the intervening variables and Community Participation and aspirationswere the moderating variables
# **Staff Qualification**

#### INTERVENING VARIABLES



# **INDEPENDENT VARIABLES**

**Figure 2.1 Conceptual Framework** 

#### 2.5 Research Gap

A review of the empirical studies shows that various factors which includes qualification of the staff, ICT infrastructure, location of the telecentres and the product mix influences the adoption of ICT in various aspects. There is also empirical evidence to show that other aspects such as community participation and community aspirations also influences the adoption of ICT in community based projects.

However, majority of this empirical evidence is found from studies conducted beyond the Kenyan borders and thus cannot be generalized in the Kenyan context. Moreover, there is little literature on telecentres in Kenya; this is despite the fact that the Kenyan government together other stakeholders is committed to ICT investments in the country though projects such as Digital Villages Project in order to provide services and reach the entire population. There is therefore need to conduct a study in the Kenyan context to investigate the factors influencing the use of information technology in telecentres in Kiambu County, Kenya.

## 2.6 Summary of the chapter

This chapter explores studies carried out by accredited researchers and scholars with reference to the factors influencing the use of information technology in telecentres. The chapter further analyzes various theories that have been used to guide the study in reference touse of information technology in telecentres and the factors that affect the usage. The conceptual framework of the study is also presented in this chapter and lastly the research gaps that have been identified from the studies reviewed.

#### **CHAPTER THREE**

#### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The chapter looks at the research methods that were employed in the study in order to achieve the objectives of the study. This chapter covers the research design adopted, population of study, sample, data collection, data analysis and ethical considerations.

#### **3.2 Research Design**

According to Kombo and Tromp (2006), research design can be thought of as the structure of research. It is the  $\exists$ glueø that holds all of the elements in a research together. The research design employed in this research was descriptive in nature. Mugendaand Mugenda(2008) explain that descriptive design studies are commonly used when examining social issues that exist in communities. The study employed both qualitative and quantitative techniques for maximum effectiveness of data collection. The descriptive design was deemed fit since enables the researcher to summarize and organize data in an effective and meaningful way and help in answering who, what, and how questions (Babbie, 2002). The descriptive design also helped in collecting data in order to answer the questions of the current status and describe the nature of existing conditions of the subject under study. Its advantage was that it was used extensively to describe behavior, attitude, characteristic and values (Mugenda&Mugenda, 2003).

## **3.3 Target Population**

A population is defined as the total collection of elements about which we wish to make some inferences (Cooper and Schindler, 2003). It is the subject such as a person, an organization, customer database, or the amount of quantitative data on which the measurement is being

taken. The target population of the study was 20leaders and staff in the telecentres in Kiambu County as well as the 10,000 community members who were the users of the telecentres.

# 3.4 Sample Size and Sampling Technique

In order to obtain reliable results from the study it is necessary to have a representative sample. Fischer formula was used to calculate the sample size that could be used at 95% confidence interval. This formula was used to calculate sample size since the target population is greater than 10,000 individuals. The sample size was therefore be:

Sample formula Sample formula  $n=\underline{z^2pq}$ 

 $d^2$ 

Where: n=Desired sample size (when population greater than 10,000)

Z =Standard normal deviation, set at 1.96, which corresponds with 95% confidence interval.

P =The proportion in the target population estimated to have a particular characteristics if here is no reasonable estimate then use 50% (0.5).

Q =Degree of accuracy desired usually set at 0.5.q=1.0-p

d = degree of freedom

Sample formula  $n = \frac{z^2 pq}{z^2}$ 

 $d^2$ 

Therefore;

Z = 1.96

P = 50% = 50/100 = 0.5

q = 1.0 ó P=1.0 ó 0.5=0.5

 $d{=}5\% = 5/100 = 0.05$ 

Hence n = 
$$(1.96)^2 (0.5) (0.5)$$
  
 $0.05^2$   
N = (3.84) (0.25)

0.0025

$$N = 0.96$$
  
0.0025

$$N = 384$$

Therefore the sample size of the study was 384 respondents. The study adopted purposive or judgmental sampling, whereby the respondents were selected based on premise that they have used a telecentre in the last one year in Kiambu County or they were seeking services at the telecentres at the time of conducting the research.

#### **3.5 Data Collection Instruments and Procedures**

Two primary data collection instruments were used during the study; a questionnaire and the interview guide. A selfóadministered questionnaire with both open and closed ended questions was developed and administered to obtain information from the community members and the staff in the Telecentres.

On the other hand, interviews were conducted with key individuals who were the staff/leaders of the Telecentes. An interview guide was developed to guide the discussion with the respondents. It was used to collect views in regard to the factors influencing the use of information technology in Telecentres.

The researcher used assistants to distribute by hand the questionnaires completed by the selected respondents. The research assistants were trained and taken through the questionnaire before the data collection process. Upon completion, the research assistants collected the questionnaires and ensured high completion rate and return of the completed questionnaires. The researcher personally administered the questionnaires through the use of data collection assistants so as to explain to the respondents on the purpose of the study and its value to them.

#### 3.6 Validity of the Research Instruments

According to Patton (2000) validity is quality attributed to proposition or measures of the degree to which they conform to establish knowledge or truth. An attitude scale is considered valid, to the degree to which its results conform to other measures of possession of the attitude. Validity refers to the extent to which an instrument can measure what it ought to measure (Neuman, 2000). It therefore refers to the extent to which an instrument asks the right questions in terms of accuracy. Mugenda and Mugenda (1999) define validity as the accuracy and meaningfulness of inferences which are based on research results. Content validity of the instrument was determined by the supervisor who discussed the items in the instrument with the supervisors, from the department and the experts in the field of study.

## **3.7 Reliability of the Research Instruments**

A pre-test was carried out on ten respondents to test the reliability of the study. The study used theCronbachøs alpha () to measure the reliability of the research instrument; whereby a Cronbachøs alpha value of 0.7 and above implied that the instrument was sufficiently reliable for the measurement (Cronbach, 1951). The objective of pre-testing was to allow for modification of various questions in order to rephrase, clarify and or clear up any shortcomings in the questionnaires before administering them to the actual respondents. These

suggestions were used in making necessary changes in the questionnaire. The ten respondents who participated in the pre-test did not participate in the main study.

#### 3.8 Data Analysis and Presentation

The filled in questionnaires containing data collected from the field were cleaned for errors before they were entered into a database, this was developed earlier before data entry starts, where it was later analyzed using Statistical Package for Social Sciences (SPSS). The data was analyzed through descriptive and inferential analysis. The descriptive statistical tool helped the researcher to describe the data and determine the extent to be used. These included frequency distribution tables and measures of central tendency (the mean), measures of variability (standard deviation) and measures of relative frequencies among others. The analysis was aided by the SPSS software, which was expected to produce various statistics, which was then be applied to analyze the quantitative data in terms of percentages, frequency distribution, means and standard deviations. The analyzed data was presented in tables and charts.

The study also used a linear regression model to test the form of relationship between the independent variables and the dependent variable. The regression took the following form:

Y = 0 + 1 1 + 2 2 + 3 3 + 4 4

Where: Y = Dependent Variable

- $_{1 =}$  independent variable
- $_0 =$  the constant

 $_{1-n}$  = the regression coefficient or change included in Yby each

= error term

# **3.9 Ethical Consideration**

The researcher obtained informed consent from any subject used in the study and ensured that all the subjects participate voluntarily. The researcher was open and honest in dealing with other researchers and the research subjects. The researcher did not exploit subjects by changing agreements made with them. In cases where the respondents became hesitant to give information because they do not know how it was used; the researcher explained the purpose of the study to the respondents to counter this challenge and also ensured on the confidentiality of the information given.

# 3.10 Operationalization Table of Variables

Objective	Dependent Variable	Indicators	Measurement	Ordinal	Tool of analysis
To investigate the factors influencing the use of information technology in Telecentres in Kiambu County, Kenya.	Use of Information Technology in Telecentres	<ul> <li>Computer access</li> <li>Internet services</li> <li>Telephone connectivity</li> </ul>	<ul><li>Availability</li><li>Cost of connectivity</li><li>Easy to access</li></ul>	Ordinal	<ul> <li>Mean, Standard deviation</li> <li>Regression Analysis</li> </ul>
	Independent Variables				
To examine how qualification of staff influence the use of information technology in Telecentres in Kiambu County	Staff Qualification	<ul> <li>Academic/professional qualifications</li> <li>Technical Skills</li> </ul>	<ul><li>Knowledge</li><li>Capacity</li><li>Skills</li></ul>	Ordinal	• Mean, Standard deviation
To examine the extent to which the existing ICT infrastructures influence the use of information technology in Telecentres in Kiambu County	Infrastructure	<ul><li>Computer sets</li><li>Internet connectivity</li><li>Electricity connectivity</li></ul>	<ul><li> The number</li><li> Availability</li><li> Electricity supply</li><li> Cost</li></ul>	Ordinal	• Mean, Standard deviation
To establish the extent to which the location of the telecentres influence the use of information technology.	Location of the telecentres	<ul> <li>Accessibility</li> <li>Availability of services/facilities</li> </ul>	<ul> <li>Distance</li> <li>Nature of the operating environment</li> <li>Easily gain access</li> <li>Variety of facilities</li> </ul>	Ordinal	• Mean, Standard deviation
To determine the extent to which product mix offered by the telecentres influences the use of information technology.	Product mix	<ul> <li>Product delivery</li> <li>viability of the product</li> <li>Addressing community needs</li> <li>Satisfaction with product offered</li> </ul>	<ul> <li>Educational products</li> <li>ICT-related products</li> <li>E-government services</li> <li>Promoting learning</li> </ul>	Ordinal	• Mean, Standard deviation

## **CHAPTER FOUR**

## ANALYSIS, PRESENTATION INTERPRETATION AND DISCUSSION

## 4.1 Introduction

This chapter entails the findings of the study based on the study objectives. The study sought to investigate the factors influencing the use of information technology in telecentres in the rural setting of Kiambu County, Kenya. The study targeted the users of the telecentres as well as the leaders and staff in the telecentres in Kiambu County. The data was analyzed and presented in form of pie charts, bar graphs and tables.

## 4.2 Response Rate

Out of a total of sample size of 384 telecentre users and 20 telecentre staff, 308 and 16 responses respectively were successfully received which translates to a response rate of 80.2% and 80% respectively. The response was appropriate for the study to continue and provide reliable results as guided by Mugenda and Mugenda (2003) who revealed that a fifty percent response rate is adequate, sixty percent good and above seventy percent rated very well.

### **4.3 Background Information**

The section presents the background information of the respondents who took part in the study. This information was critical in understanding the different responses according to the respondentsø background information. The background information gathered includes the gender of the respondents, highest level of education reached and age of the respondents, designation of the telecentre staff and duration worked in the telecentre.

## 4.3.1 Gender of the Respondents

In this section the study sought to establish the gender of the telecentre users. The results showed that there were 57.5% males while there was 42.5% females.

The findings show that 57.5% of the Telecentre users were male while 42.5% were female. This shows that the uses of telecentes in the rural setting of Kiambu County were both male and female.

## 4.3.2 Level of Education

The respondents were asked to indicate their highest level of education reached. The findings are presented in table 4.2 below.

## **Table 4.2 Level of Education**

Educational level	O-Level	College Level	Under graduate	Post graduate
Percentage	31.5% (97)	38.3% (118)	25.7% (79)	4.5 % (14)

Table 4.2 show that 38.3% of the respondents had reached college level while 31.5% revealed that they had reached O-level as their highest level of education. On the other hand, 25.7% of the respondents indicated that they had reached undergraduate level while 4.5% were post graduates.

## 4.3.3 Age of the Respondents

In this section, the study sought to establish the age of the respondents, who were the users of the telecentre in the County. The findings are presented below.

	Table 4.3	Age	of	the	Res	pon	dents	S
--	-----------	-----	----	-----	-----	-----	-------	---

Age	of	18-25	26-35	36-45	46-55	Over 55
respondents						
Percentage		52.9% (163)	35.7% (110)	5.2% (16)	4.9 % (15)	1.3% (4)

Table 4.3 shows that 52.9% of the respondents were between 18-25 years of age while 35.7% were between 25-35 years of age. This shows that majority of the users of the telecentres were the youth (35 years and below). On the other hand, 5.2% of the respondents indicated that they were between 36-45 years of age, 4.9% were between 46-55 years while 1.3% were above 55 years of age.

## 4.3.4 Designation

The respondents were asked to indicate their designation in the telecentres. The findings are presented below.

Designation	Frequency	Percentage
General Staff	11	68.8
Managers	5	31.2
Total	16	100.0

#### **Table 4.4 Designation of Telecentre Staffs**

On the designation of the telecentre staffs that took part in the study, majority (68.8%) indicated that they were general staff offering services such as computer training while 31.2% were managers of the telecentres.

# 4.3.5 Duration Worked in the Telecentre

The respondents were asked to indicate the duration they had worked in the telecentres. This was critical since it could determine their experience in working and operating of telecentres which would further determine the reliability of the information given.

Duration	Frequency	Percent
Below3 years	2	12.5
3-5 years	12	75.0
6-10 Years	2	12.5
Total	16	100.0

Table 4.5 shows that majority of the staffs (75%) had worked in the telecentres for a duration of 3-5 years while 12.5% had worked for aduration of below 3 years and 6-10 years respectively. This shows that majority of the respondents had worked in the telecentres for a longer duration thus reliability of the information given.

# 4.3.6 Use of Telecentre Services

The study sought to find out whether the respondents used the telecentres and further enquired about the services that were most sought in the telecentres.

|--|

Responses	Frequency	Percent	
Yes	247	80.2	
No	61	19.8	
Total	308	100.0	

Table 4.6 show that an overwhelming 80.2% of the respondents indicated that they used the telecentres. Majority of the respondents indicated that they used telecentres for browsing, checking my mails and sending mails, for job search for research information and other internet services, printing, photocopy and scanning, E-government services, News and movies.

## 4.3.7 Telecentres Promote and Encourage Community Participation

The study sought to establish whether the telecentres in the area promoted and encouraged participation in the community. The results are presented in table 4.4.

**Table 4.7 Telecentres Promote and Encourage Community Participation** 

Responses	Frequency	Percent	
Yes	258	83.8	
No	50	16.2	
Total	308	100.0	

Table 4.7 Shows majority of the respondents (83.8%) revealed that the Telecentres in the area promoted and encouraged community participation. However, 16.2% indicated that they did not promote and encourage community participation.

### 4.4 Staff Qualifications

In this section the study sought to establish the extent to which qualification of staff influence the use of information technology in Telecentres in Kiambu County.

#### 4.4.1 Adequate Computer Skills

The respondents were asked to indicate whether they had adequate computer skills to enable them use the telecentres. The findings shows that majority of the respondents (69.5%) had adequate computer skills to enable them use the telecentres. However, 30.5% indicated that they did not have adequate computer skills.

#### 4.4.2 Extent of Use of a Computer

The study sought to establish the extent to which the respondents conduct various activities in the telecentres using a computer. A scale of 1-5 was used to interpret the results of the study. The scores õno extentö and õlittle extentö were represented by mean score, equivalent to 1 to 2.5 on the continuous Likert scale (1 Ö little extentÖ 2.5). The scores of  $\pm$ moderate extentø were equivalent to 2.6 to 3.5 on the Likert scale (2.6 Ö moderate extent Ö3.5). The score of õgreat extentö and õvery great extentö represented were equivalent to 3.6 to 5.0 on the Likert scale which means that the agreement was to a great extent.

Activities	Mean	Std. Deviation
Connecting to the Internet	3.78	1.337
Communicating (E-Mail, Messenger, Chatting, etc)	3.68	1.371
Use a search engine to locate information on the Internet	3.09	1.508

#### Table 4.8 Extent of Use of a Computer

Table 4.8 show that majority of the respondents indicated that could use a computer to connect to the internet and communicate through E-Mail, Messenger, Chatting, etc; this is shown by a mean score 3.78 and 3.68 respectively. However, majority of the respondents were neutral on whether could use a search engine to locate information on the Internet as shown by a mean score of 3.09 on the likert scale.

## 4.4.3 Computer Skills and Use of ICT in the Telecentre

The study sought to establish the extent to which computer skills affect the use of ICT in the telecentre in Kiambu County. The findings are presented in Table 4.8

Duration	Frequency	Percent
Very Great	90	29.2%
Great Extent	116	37.7%
Moderate Extent	66	21.4%
Little Extent	28	9.1%
No Extent	8	2.6%
TOTAL	308	100

 Table 4.9 Computer Skills and Use of ICT in the Telecentre

Table 4.9 shows that 37.7% of the respondents agreed to a great extent while 29.2% agreed to a very great extent that computer skills affect use of ICT in the telecentre. On the other hand, 21.4% agreed to a moderate extent while 9.1% agreed to a little extent that computer skills affect use of ICT in the telecentres.

The telecentre staffs further stated that computer skills among community members affected the use of ICT in the telecentres. They indicated that most community members lack computer skills thus they are unable to browse through, do research online among other things. They explained that people with ICT skills utilize ICT facilities more than those who dongt have.

## 4.5 Location of Telecentres and Use of ICT

The study sought to establish the extent to which the location of the telecentre influenced the use of information technologyin telecentres in Kiambu County.

## 4.5.1 Location of Telecentres and Use of ICT

The respondents were asked to indicate their level of agreement on various statements on location of telecentres and use of ICT in Kiambu County. A five point likert scale was used to interpret the respondents whereby the scores of õStrongly disagreeö and õdisagreeö were represented by mean score, equivalent to 1 to 2.5 on the continuous Likert scale (1 Ö disagreeÖ2.5). The scores of -neutralø were equivalent to 2.6 to 3.5 on the Likert scale (2.6 Ö neutral Ö3.5). The score of õagreeö and õstrongly agreeö represented were equivalent to 3.6 to 5.0 on the Likert scale.

Location	Mean	Std.
		Deviation
The location and access of the telecentres are convenient for me	3.53	1.349
The telecentres are located within an appropriate geographical	3.32	1.254
distance for the community		
Telecentre is too far from my home	2.33	1.290
Telecentre is away from convenient connection with electricity,	2.40	1.374
internet.		

## Table 4.10Location of Telecentres and Use of ICT

Table 4.10shows that majority of the respondents agreed to a moderate extent that the location and access of the telecentres was convenient for them and that the telecentres were located within an appropriate geographical distance for the community; this is shown by a mean score of 3.53 and 3.32 on the likert scale. However, the respondents disagreed that telecentre was too far from their home and that the telecentre was away from convenient connection with electricity and internet; this is shown by mean scores of 2.33 and 2.40 respectively on the likert scale.

## 4.5.2 Extent the Location of the Telecentreaffect Use of ICT

The study sought to establish the extent to which location of the telecentre affected the use of ICT in Kiambu County. The findings are presented in Table 4.11 below.

Location influence on use	Frequency	Percent
of ICT		
Very Great	83	26.9%
Great Extent	108	35.1%
Moderate Extent	97	31.5%
Little Extent	16	5.2%
No Extent	4	1.3%
TOTAL	308	100

 Table 4.11Extent the Location of the Telecentre affect Use of ICT

Table 4.11 shows that 35.1% revealed that location of the telecentre affected the use of ICT in Kiambu County to a great extent while a further 26.9% agreed to a very great extent. However, 31.5% of the respondents agreed to this to a moderate extent while 5.2% agreed to a little extent.

The telecentres on the other hand acknowledged that location of telecentres affected use of ICT since some locations were inaccessible, had poor network, impassable roads and did not have electricity. Location also affected other aspects such as network coverage thus affecting accessibility of information. However, a few of the staff indicated that location did not affect use of ICT.

### 4.6 ICT FacilitiesAnd Use of ICT

In this section the study sought to establish the extent to which the existing ICT infrastructures influenced the use of information technology in telecentres in Kiambu County.

## 4.6.1 Facilities in the Telecentre

The respondents were asked to indicate whether there were adequate facilities in the telecentres that they used. The findings are shown below.

Responses	Frequency	Percent	
Yes	114	37.0	
No	194	63.0	
Total	308	100.0	

 Table 4.12 Facilities in the Telecentre

Table 4.12 shows that majority of the respondents (63%) indicated that there were no adequate facilities in the telecentres. Only 37% of the respondents indicated that there were adequate facilities in the telecentres.

The respondents further stated that critical facilities lacking were computers, power, lack of photocopiers, scanners, laminators and printers, lack of enough chairs, desktops and reliable network, little space, reading materials and lack of up to date computer applications and operating windows.

# 4.6.2 Facilities of Telecentres and Use of ICT

The study here sought to establish the extent to which facilities of telecentres affect the use of ICT. The findings are presented in table 4.12 below.

ICT Facilities	Mean	Std.
		Deviation
The facilities and equipment provided by Telecentre are	2.84	1.099
satisfactory		
The interior conduciveness of the telecentres are satisfactory	2.97	1.023
The is reliable Internet at the telecentres is appropriate	3.02	1.179
There are sufficient number of computers available at the	2.60	1.247
telecentres		
There is reliable power/electricity	3.04	1.395

## Table 4.13 Facilities of Telecentres and Use of ICT

Table 4.13The study findings show that majority of the respondents were neutral on whether there was reliable power/ electricity and on whether there was reliable Internet at the telecentres; this is shown by a mean scores 3.04 and 3.02 respectively. The respondents were also neutral on whether the interior conduciveness of the telecentres was satisfactory; the facilities and equipment provided by telecentre were satisfactory and; there were sufficient number of computers available at the telecentres; this is shown by mean scores of 2.97, 2.84 and 2.60 respectively on the likert scale.

## 4.6.3 Facilities Availability and Use of ICT in the Telecentre

The respondents were asked to indicate the extent to which availability of facilities influenced the use of ICT in the Telecentres. The results are presented inTable 4.13 below.

Facilities Availability and influence	e on Frequency	Percent
use of ICT		
Very Great	87	28.2%
Great Extent	107	34.8%
Moderate Extent	70	22.7%
Little Extent	16	5.2%
No Extent	28	9.1%
TOTAL	308	100

#### Table 4.14Facilities Availability and Use of ICT in the Telecentre

Table 4.14shows that 34.8% of the respondents indicate revealed that availability of facilities influenced the use of ICT in the telecentres to a great extent this was also agreed upon by 28.2% of the respondents agreed to a very great extent. However, 22.7% agreed to this to a moderate extent while 5.2% agreed to a little extent.

The telecentres staff further stated that the existing facilities affected the use of ICT for instance lack of enough computers makes it difficult to meet the target and the peopleøs needs. Others indicated that they did not have the required facilities and network services while other machines were old and efficient thus making it difficult to use ICT.

#### 4.7 Product Mix and Use of ICT in Telecentres

This section sought to answer the fourth objective of the study which sought to determine the extent to which product mix offered by the telecentres influenced or affected the use of information technology.

## 4.7.1 Services Offered in the Telecentres

The respondents were asked to indicate the services that were offered in the telecentres in Kiambu County. The findings are as shown in Table 4.14 below.

Services Offered	Frequency	Percent
Computers	216	70.1
Internet connections	235	76.3
Telephone services	29	9.4
Photocopier	236	76.6

# **Table 4.15 Services Offered in the Telecentres**

Table 4:15 shows majority of the respondents indicated that the services offered in the telecentres were majorly photocopier services(76.6%), internet connections (76.3%) and computer services (70.1%). However, telephone services were rarely offered in the telecentres as indicated by 9.4% of the respondents.

The respondents further stated that there were other Services offered in the telecentressuch as: the E-learning, E- Government services and forms such as KRA Pin, NHIF, NSSF, Mpesa services, printing services, scanning and binding materials, projector screen, training on computer packages/skills, Agricultural/ veterinary services and information, Library, Survey and research materials, newspapers, videos, movies and games.

#### 4.7.2 Satisfaction with Quality of Services

On overall, the study sought to determine the respondents satisfaction levels with the quality of services offered in the telecentres. The findings are presented in table 4.15

# Table 4.16Satisfaction with Quality of Services

Satisfaction with Quality of Services	Frequency	Percent
Very Satisfied	49	15.9%
Satisfied	116	37.6%
Dissatisfied	116	37.6%
Very dissatisfied	27	8.8%
TOTAL	308	100

Table 4.16shows that while 37.6% indicated that they were dissatisfied with the quality of services offered, a similar percentage revealed that they were satisfied with the quality of services; this was also supported by 15.9% of the respondents who indicated that they were very satisfied while 8.7% indicated that they very dissatisfied.

# 4.7.3 Product Mix and Use of ICT in the Telecentres

Table 4.17 below presents respondents findings on their level of agreement on the extent to which the product mix influence the use of ICT in Telecentes.

# Table 4.17Product Mix and Use of ICT in the Telecentres

Statements on Product Mix	Mean	Std.
		Deviation
The Telecentres do provide opportunities for further	3.75	1.009
improvement of my knowledge and skills in using computers		
The cost imposed to use the services at the telecentres is	3.12	1.195
reasonable		
The information provided by Telecentres is Up-to-date	3.32	.976

The Telecentre is always open at a time when I can visit	3.50	1.122
The Telecentre information is more relevant to my needs and the	3.65	1.056
local needs		
The information provided by the Telecentres is easy to use	3.77	.924
Telecentre management/administrators promotes and encourages	3.84	1.072
equitable access to services in my community		

Table 4.17shows that majority of the respondents agreed that the telecentre management/administrators promoted and encouraged equitable access to services in my community; the information provided by the Telecentres was easy to use; the Telecentres provided opportunities for further improvement of my knowledge and skills in using computers; and that the telecentre information was more relevant to their needs and the local needs; this is presented by mean scores of 3.84, 3.77, 3.75 and 3.65 respectively on the likert scale. However, the respondents were neutral on whether information provided by telecentres was up-to-date and on whether the cost imposed to use the services at the telecentres was reasonable; this is shown by mean scores of 3.32 and 3.12 respectively.

# 4.7.4 Product Mix and the Use of ICT

This section sought to establish the extent to which product mix affected the use of ICT in the telecentres in Kiambu County. The findings are presented below.

#### Table 4.18Product Mix and the Use of ICT

Extent	Frequency	Percent
Very great extent	84	27.3
Great extent	140	45.5
moderate extent	61	19.8
Little extent	17	5.5
No extent	6	1.9
Total	308	100.0

Table 4.18 shows that 45.5% of the respondents agreed to a great extent that product mix offered affected the use of ICT in the telecentres in Kiambu County; this was further supported by 27.3% who agreed to a very great extent. However, 19.8% were moderate while 5.5% agreed to a little extent.

The telecentre staff further indicated that the services offered in the telecentre affected the use of ICT. They explained that due to few facilities such as computers were expected to perform many tasks. For instance when some telecentres offered computer classes, it became difficult to offer internet services to other people. Also due to multi-tasking, it was sometimes difficult to offer some services.

## 4.8 Regression Analysis

A multivariate regression model was applied to determine the form of association between each of the four variables with respect to use of ICT in telecentres in Kiambu County.

		R Square (		
Model	R	<b>R</b> <sup>2</sup> )	Adjusted R Square	Std. Error of the Estimate
1	0.845(a)	0.714	0.697	0.257

Table 4.19 Model Summary

Table 4.19 above shows the value of adjusted  $R^2$  (co-efficient of determination) is 0.697. This implies that, there was a variation of 69.7% between use of ICT in telecentres and the four variables; qualification of the staff, infrastructure, location of the telecentres and product mix.A Predictors: (Constant), Qualification of the staff, infrastructure, location of the telecentres, Product mix.The  $R^2$  is called the coefficient of determination and tells us how use of ICT in telecentres varied with the predictors- qualification of the staff, infrastructure, location of the telecentres and product mix.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.718	4	2.930	44.231	0.000(a)
	Residual	19.998	303	0.066		
	Total	31.716	307			

**Table 4.20 ANOVA Results** 

Table 4.20 shows a Predictors: (Constant), Qualification of the staff, infrastructure, location of the telecentres, Product mix.

b Dependent Variable: Use of information technology in telecentres. The study used ANOVA to establish the significance of the regression model from which an f-significance value of p<0.001 was established. This shows that the regression model has a less than 0.001

likelihood (probability) of giving a wrong prediction. This therefore means that the regression model has a confidence level of above 95% hence high reliability of the results.

	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
А	В	Std. Error	Beta		
(Constant)	0.116	0.186		.623	0.535
Qualification of staff	0.577	0.068	0.559	8.478	0.000
Infrastructure	0.157	0.043	0.257	3.676	0.000
Location of the	0.052	0.024	0.139	2.115	0.038
telecentres					
Product mix	0.008	0.001	0.505	7.097	0.000

Table 4.21Coeff	icients Results
-----------------	-----------------

Table 4.21 shows ADependent Variable: Use of information technology in telecentres

The co-efficient results show that there is a positive relationship between use of information technology in telecentres with and the predictor factors: qualification of the staff, infrastructure, location of the telecentres and product mix. The established regression equation was

 $Y = 0.116 + 0.577X_1 + 0.157X_2 + 0.052X_3 + 0.008X_4$ 

The study further found out that there was a significant relationship between use of information technology in telecentres and the four factors; qualification of staff (p= 000<0.05), infrastructure (p= 000<0.05), location of the telecentres(p = 0.038<0.05) and product mix (p= 000<0.05) as shown by the p values.

#### **CHAPTER FIVE**

## SUMMARY, CONCLUSION AND RECOMMENDATIONS

### **5.1 Introduction**

This chapter is a synthesis of the entire thesis and contains summary of findings, conclusions arrived at, policy recommendations and suggestions for further studies.

## 5.2 Summary of the Study

The study found out that majority respondents indicated that they used the telecentres. The majorly used telecentes for browsing, checking my mails and sending mails, for job search for research information and other internet services, printing, photocopy and scanning, E-government services, and News. The study also found out that majority of the respondents indicated that the telecentres in the area promoted and encouraged community participation.

On the staff qualifications, the study first established that majority of the respondents had adequate computer skills to enable them use the telecentres. Majority of the respondents could use a computer to connect to the internet and communicate through E-Mail, Messenger, and Chatting. However, majority of the respondents were neutral on whether could use a search engine to locate information on the Internet. The study further shows that the respondents agreed to a great extent that computer skills affect use of ICT in the telecentre.

On the location of telecentres and its influence on use of ICT, the respondents agreed to a moderate extent that the location and access of the telecentres was convenient for them and that the telecentres were located within an appropriate geographical distance for the community. However, the respondents disagreed that telecentre was too far from their home and that the telecentre was away from convenient connection with electricity and internet. On

overall, the majority revealed that location of the telecentre affected the use of ICT in Kiambu County to a great extent.

The study also established that there were no adequate facilities in the telecentres. Some of the critical facilities lacking were computers, power, lack of photocopiers, scanners, laminators and printers, lack of enough chairs, desktops and reliable network, little space, reading materials and lack of up to date computer applications and operating windows. The study further findings show that the respondents were neutral on whether there was reliable power/ electricity and on whether there was reliable Internet at the telecentres. The respondents were also neutral on whether the interior conduciveness of the telecentres was satisfactory; the facilities and equipment provided by telecentre were satisfactory and; there were sufficient number of computers available at the telecentres. On overall, majority of the respondents revealed that availability of facilities influenced the use of ICT in the telecentres to a great extent

On the product mix, the study first established that the services majorly offered in the telecentres were photocopier services, internet connections and computer services. Other Services offered in the telecentres included the E-learning, E- Government services and forms such as KRA Pin, NHIF, NSSF, Mpesa services, printing services, scanning and binding materials, projector screen, training on computer skills, Agricultural/ veterinary services and information, Library, Survey and research materials, newspapers, videos, movies and games. Majority of the respondents were satisfied with the quality of services offered in the telecentes.

On the other hand, majority of the respondents agreed that the telecentre management/administrators promoted and encouraged equitable access to services in their community; the information provided by the telecentres was easy to use; the

telecentresprovided opportunities for further improvement of my knowledge and skills in using computers; and that the telecentre information was more relevant to their needs and the local needs. However, the respondents were neutral on whether information provided by telecentres was up-to-date and on whether the cost imposed to use the services at the telecentres was reasonable. On overall the study established that product mix offered affected the use of ICT in the telecentres in the rural setting of Kiambu County.

#### 5.3 Conclusion of the study

The study concludes that staff qualifications and especially computer skills affect use of ICT in the telecentre. Most of the services offered included connecting to the internet and communicating through E-Mail, Messenger, and Chatting as well as use a search engine to locate information on the internet would require someone to have skills to operate a computer.

It can also be concluded that location of the telecentre affect the use of ICT. Location of the telecentre affects its access to convenient connection with electricity and internet. The telecentres that located far or are not within an appropriate geographical distance for the community may not be convenient for them to use thus also affecting the use of ICT.

The study also concludes that the telecentres in Kiambu County did not have adequate facilities; they lackedcritical facilities such as computers, power, photocopiers, scanners, laminators and printers, lack of enough chairs and space, as well as unreliable internet.Unavailability of some of these facilities affected the use of ICT in the Telecentres to a great extent.

Lastly, the study concludes that product mix offered in the telecentres varied from paper work for instance printing services, scanning and binding materials as well as computer work such as browsing, E-learning services, E- Government services and training on computer skills. Not all of these services needs adoption of ICT and thus the mix of products and services offered by these telecentesinfluenced greatly on whether they need to adopt ICT or not.

#### 5.4 RecommendationsOf The Study

Qualified staff and managers are essential for the development of telecentres and integrating ICT into the programmes. The study therefore recommends that there is need to employ qualified and competent staffs with adequate qualifications and experience so as have a significant contribution in the adoption and use of ICT in the telecentres.

It can be recommended that it is essential for the government and the local authorities to provide critical facilities and infrastructure in the telecentres that fits local needs and so as to ensure that the community accesses appropriate service in the telecentres and also offer supportive learning environment that enables engagement and empowerment of the community members. Provision of adequate and appropriate facilities would ensure the sustainability of the telecentres.

The study also recommends that ICT is the key to access economic progress, supporting rural community development and creation of knowledge in rural areas for instance in areas of agriculture research and information. Therefore it is essential to promote use of ICT in the telecentres but is should be tailored with the community needs and interests.

### 5.5 Suggestions for Further Research

The study suggests that a further research is needed to gauge the extent to which the existence of telecentres in the rural areas have enhanced acquiring of new knowledge, improving of professional skills, impacts on agricultural production, and the strengthening social ties (connectivity) in the community.

#### REFERENCES

Abdul Razak, N, 2005. An analysis of Malaysian e- community centre in Bridging the Digital Divide: A paper presented at the e-Malaysia Seminar, on December 6-7.

Abdul Razak, N, 2009. Empowering Communities via the Telecentres: Europian Journal of

Social Sciences- 9: 3.

- Ajzen I., (1985). From Intentions to Actions: A Theory of Planned Behaviour, in Action Control: From Cognition to Behavior, Kuhl, J. and Beckman J. (eds).
- Alemna, A.A and Joelm, S. (2006). Critical Issues in Information and Communication Technology for Rural Development: Information Development Journal, 22 (4).
- Apulu and Latham. ICT Adoption: Challenges for Nigerian SMEs. TMC Academic Journal, 2009, 4(2):64-80.

Ariyabandu, R. (2009). Role of telecentres as knowledge networks: successes and challenges.

Information and Communication Technology and Disaster Risk Reduction Division, United Nations ESCAP, United Nations Building, RajdamnernNok Avenue, Bangkok, 10200.

Badsar, M., Samah, B. A., Hassan, M. A., Osman, N. B., &Shaffri, H. A. (2011). Predictor factors of telecentres outcome from the users perspectives in rural communities. American Journal of Applied Sciences, 8(6), 617-627.

Bagozzi, R. P.; Davis, F. D.; Warshaw, P. R. (1992). "Development and test of a theory of technological learning and usage.", Human Relations, 45(7): 6606686

Bahaman, A.S., Hassan, M.A., Osman N. and Badsar, M. (2010). A Paper Presented At the International Conference on Sustainable Community Development, in Malaysia.

Bailey, A. and Ngwenyama, O. (2009). Social Ties, Literacy Location and the Perception of Economic Opportunity: Factors influencing Telecentre Success in a

57

Development Context: Proceedings of the 2nd Hawaii International Conference on System Science.

Bashir, M. S., Samah, B. A., Emby, Z., Badsar, M., Shaffril, H. M., & Aliyu, A.U. (2011).

- Information and Communication Technology Development in Malaysia: Influence of
- competency of leaders, location, infrastructures and quality of services on telecentre success in rural communities of Malaysia. Australian Journal of Basic and Applied Sciences, 5(9), 1718 1728.
- Benjamin, P., 2000. ICT Conference Paper. Retrieved from: http://www.link.wits.ac.za
- Caroline, I.P., Brenda M., and David, S. (2006). An exploration of the Categories Associated with ICT Project Sustainability in Rural Area of Developing Countries: A Case Study of Dwesa Project, Proceedings of SAICSIT pp: 100-106.
- Colle, R.D. (2005). Memo to Telecentre Planners. The Electronic Journal on Information Systems in Developing Countries, 21(1): 1-13.
- Comolli, L. (2008). Increasing Telecentre Network Sustainability through Social Enterprise. Telecentre Magazine, 2:4, pp. 18-22.
- Conrade, D.P., Mories and Jacobs, S.J. (2003).Using Information and Communication Technologies (ICTs) for Deep Rural Development in South Africa. Communication, 29(1): 199-217.
- Conroy, C., (2006).TelecentreIntiative in Rural India: Failed Fad or the way forward? Natural Resources Institute, University of Greenwich
- Day, P. (2005). Sustainable Community Technology: The symbiosis between community technology and community research. The Journal of Community Informatics, 1(2).
- Davis, F. D. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology", MIS Quarterly, 13(3): 3196340

Farr, P. and Papandrea, F. (2006).Sustainability of Community Online Access Centres. In Governance of Communication Networks pp: 165-185.

Hallberg, D., Kulecho, M., Kulecho, A., Okoth, L. (2011). Case studies of Kenyan digital villages with a focus on women and girls Journal of Language, Technology & Entrepreneurship in Africa Vol. 3 No. 1

Hansson, H., Mozelius, P., Gaiani, S., & Meegammana, N. (2010). Women Empowerment in
Rural Areas through the Usage of Telecentres - A Sri Lankan
Case
Study.2010
International Conference on Advances in ICT for Emerging
Regions (ICTer), 5-10.

- Harris, R., (2001). Telecentres in Rural Asia: Toward a Success Model. Conference
  Proceedings of International Conference on Information Technology,
  Communication and Development (ITCD 2001), November 29-30, 2001,
  Kathmandu, Nepal.Retrieved from: <u>www.itcd.net</u>.
- Harris, R., Kumar, A. and Balaji, V. (2003).Sustainable Telecentres? TwoCases from India, in The DigitalChallenge: Information Technology in the Development Context, Krishna,S. and Madon, S. (eds.), Chapter 8, 124-135
- Harris R.W., (1999). Attitudes Towards End-User Computing: A Structural Equation Model, Behaviour and Information Technology, Vol. 18 No. 2. 109-125.

Hunt, P., 2001. True Stories: Telecentre in Latin America and the Caribbean, the Electronic

Journal on Information System in Developing Countries, 4. Retrieved from:

http//www.is.cityu.edu,hk/ejisdc/vol4.htm.

IDRC, http://www.idrc.ca/research/ xacacia\_e.html

Ibrahim, H., Yasin, A., &Dahalin, Z. (2010). Financial sustainability issues in Malaysiaøs telecentres. Computer and Information Science, 3(2), 235-240

- Igbaria, M., Guimaraes, T. and Davis, G.B., (1995). Testing the Determinants of Microcomputer Usage via a Structural Equation Model, Journal of Management Information Systems, Volume 11, No. 4, pps.87-114.
- Islam, S. and N. Hassan, 2008. Multipurpose Community Telecentres in Bangladesh: Problem and Prospects. The Electronic Library, 27(3): 537-553.
- Jauernig, C., 2003. Review of Telecenter Sustainability Criteria for the Establishment of Sustainable Rural Business Resource Centers for SMEs in Developing Countries United Nations Industrial Development Organization (UNIDO), Vienna (United Nations Industrial Development Organization o. Document Number)
- Jones, D.K., Jamieson, S., Behrens and Mary, C. (2005). What Makes ICT Implementation Successful: A Case study of Online Assignment Submission Central Queensland University.
- Joseph, M.K. and T.N. Andrew, (2007). Information and Communication Technology Policy Imperatives for rural Development: IFIP International Federation for Information Processing.Volume 241, Home informatics and Telematics.
- Kumar, R. and M. Best, (2000). Social Impact and Diffussion of Telecentre Use: A Study from the Sustainability Access in Rural India Project: International Development Group, Department of Urban Studies and Planning, Massachusetts Institute of Technology, Cambridge.
- Lallement, D., Terrado, E.N. & Zhang, Y., (2006). Empowering information and communication technologies in isolated areas: learning from the solar-net villages program in honduras. Renewable & Sustainable Energy Reviews, 10(1), p.46.
- Mahmood, K., (2005). Multipurpose Community Telecentres for Rural development in Pakistan: Journal of the Electronic Library, 23(2): 204-220.

- Meng, C.C., Samah, B.A. & Omar, S. Z. (2013). A Review Paper: Critical Factors Affecting the Development of ICT Projects in Malaysia. Asian Social Science; Vol. 9, No. 4. Published by Canadian Center of Science and Education
- Mphalele, M.E. and E.M. Maisela, (2003). Critical Success Factors in Telecentre Sustainability: A Case Study of Six Telecentres in the Limpopo Province. Communication, 29(182): 218-232.
- Mucheru, M. F. (2013). Factors Influencing Adoption Of Information Systems In Private Healthcare Facilities In Kiambu County, Kenya. Unpublished MBA thesis. University of Nairobi.
- Muinde, F. N. (2009). Investigation of Factors Affecting the Adoption of Information and Communication Technologies for Communication of Research Output in Research Institutions in Kenya.http://hdl.handle.net/10063/1417
- Norizan, A. R. (2009). Empowering the rural communities via the telecentres. European Journal of Social Sciences, 9(3), 425-432.
- Norizan, A. R., &Jalaluddin, A. M. (2008).Bridging Digital Divide in Malaysia: Cyber Learning for the Marginalized Community. Paper presented at the Distance Learning and Internet Conference, 19-22 November, 2008, Tokyo, Japan.
- Norizan, A. R., Zaharah, H., &Rosseni, D. (2010).Bridging the Digital Divide: An Analysis of the Training Program at Malaysian Telecenters. Paper presented at The 6th WSEAS International Conference on Applied and Theoretical Mechanics, Athens,

Greece. 2010.

O¢Neil, D., 2002. Assessing Community Informatics: A Review of Methodology Approaches for Evaluating Community Networks and Community Technology Centres, Internet Research. Electronic Networking Application and Policy, 12(1): 76-93.
Rao, S. S. (2008). Social development in Indian rural communities: adoption of telecentres. International Journal of Information Management, 28(6), 474-482.

- Rao, S.S., 2009. Achieving millennium development goals: Role of ICTS innovations in India. Telematics and Informatics, 26(2): 127-143.
- Richardson, D; Ricardo, R; and Moinul, H. (2000).Grameen Telecomøs Village Phone Programme in Rural Bangladesh: A Multi-media Case Study. Paper published on the world wide web and available at www.telecommons.com/villagephone

Rogers, E.M., (2003). Diffusion of innovations: Free press.

- Roman, R., &Colle, R. D. (2002). Themes and issues in telecentre sustainability development informatics. Working Paper Series, Paper No. 10. Institute for Development Policy and Management, University of Manchester, Precinct Centre, Manchester.
- Scott, M., (2001).Telecentre Around the World: Issue to be Considered and Lessons
   Learned.ICT Development Group for CIDAøs Canada-Thai Telecentre Project,
   May,2001.13800 CommerceParkway,MacDonaldDettwiller Building
   Richmond,British Columbia Canada VSV 2J3.
- Slaymaker, R.C.T., (2002). ICTs and Rural Development:Review of the Literature, Current Interventions and Opportunities for Action (No. Working Paper 192 Results of ODI research presented in preliminary form for discussion and critical comment).London, SE1 7JD, UK. (Overseas Development Institute o. Document Number)
- The World Bank Group. (2012). ICT for greater development impact: World Bank Group Strategy for Information and Communication Technology. Retrieved from http://www.worldbank.org/.../WBG\_ICT\_Strategy-2012.pdf.

- Thioune, R. M. (2003). Opportunities and Challenges for Community Development (Vol. 1). Codesria.
- Young, J. and R. Gail, (2001). A Preliminary Evaluation of online Access Centres: Promoting Micro E-business Activity in Small, Isolated Communities, in the Electronic Journal Information Systems in Developing Countries, Volume 4. Retrieved from:http://www.is.cityu.edu.hk/ejisdc/vol4.htm
- Yusop, N.I., H.I. Muhd, K. Kasiran, M.Z. AjiandZulkhairi, (2009). Community Participation as a Determinant of Telecentresø Success: PusatKajian E-komuniti, FSSK, UKM 18-19 MAC 2009.
- Zahurin, M.A., H.I. Huda, M.K. Khairudin, Y. Nor Iadah, M.Y.S. Affendi and M.D. Zulkhairi, (2009).Management Practice Sustaining Telecentres. Paper presented at the Seminar Kebangsaan E-Komuniti.

### APPENDICES

### **Appendix I: Letter of Transmittal**

Njeru Job Rinus P.O BOX 21541-00100, Nairobi.

To whom it my concern,

Dear Sir/Madam,

#### **Re: Letter of Request to Conduct Research**

I am a postgraduate student at the University of Nairobi pursuing a Masters of Arts degree in Project Planning and Management. I am currently undertaking a research on the factors influencing the use of information technology in telecentres in the rural setting of Kiambu County, Kenya.

I am pleased to inform you that you have been selected to participate in the study. I therefore request you to provide information through the provided questionnaire. Kindly answer all the items in the questionnaire provided. The information that you will give will be treated with utmost confidence and data provided will be used for academic purposes only.

Thank you in advance for participating,

Yours faithfully,

Njeru Job Rinus

### **Appendix II: Questionnaire**

This questionnaire seeks to collect data from the community members who are users of the Telecentres in Kiambu. The study seeks to investigate the factors influencing the use of information technology in Kiambu, Kenya. Tickappropriately or write down your answer in the space provided. Your cooperation and feedback is valued and highly appreciated.

### **SECTION A: General Information**

4 Gender

a)Male ()b)Female()

5 Highest completed level of education

a) O- Level ()b) College Level () c) under- graduate ()d) Post Graduate Degree ()

- 6 Age bracket:
  - a) 18-25 years () b) 25-35 years () c) 36-45 years ()

d) 46-55 years () e)Over 56 years ()

- 7 Do you use Telecentre services?
  - a) Yes () b) No ()

8 What services do you mostly get from the telecentres?.....

9 Does the telecentre promote and encourage participation in your community

a) Yes () b) No ()

## Section C: Staff Qualifications

10 Do you have adequate computer skills?

a) Yes () b) No () b)

11 To what extent can you conduct the following activities using a computer? Use a scale of 1-5 where 5 is to a Very great extent, 4 is to a great extent, 3 is to a moderate extent, 2 is to a little extent while 1 is to no extent

	1	2	3	4	5
Connecting to the Internet					
Communicating (E-Mail, Messenger, Chatting, etc)					
Use a search engine to locate information on the Internet					

- 12 To what extent do you think computer skills affect the use of ICT in the telecentre in your area?
  - a) To a Very great extent () b) To a great extent ()c) To a moderate extent ()
  - d) To a little extent () e) To no extent ()

## **Section D: Location of Telecentres**

13 To what extent do you agree with the following statements on location of telecentres and use of ICT? Use a scale of 1-5 where 5 is strongly agree, 4 Agree, 3 is Neutral, 2 is disagree while 1 isstrongly disagree

	1	2	3	4	5
The location and access of the telecentresare convenient for me					
The telecentres are located within an appropriate geographical distance					
for the community					
Telecentre is too far from my home					
Telecentre is away from convenient connection with electricity, internet.					

- 14 To what extent do you think location of the telecentre in your area affect the use of ICT?
  - a) To a Very great extent () b) To a great extent () c) To a moderate extent
    - ( )
  - d) To a little extent () e) To no extent ()

## **Section E: ICT Facilities**

15 a). Are there adequate facilities in the telecentre?

a) Yes () b) No ()

16 To what extent do you agree with the following statements on facilities of telecentres and use of ICT? Use a scale of 1-5 where 5 is strongly agree, 4 Agree, 3 is Neutral, 2 is disagree while 1 isstrongly disagree

Statements		2	3	4	5
The facilities and equipment provided by Telecentre are satisfactory					
The interior conduciveness of the telecentres are satisfactory					
The is reliable Internet at the telecentres is appropriate					
There are sufficient number of computers available at the telecentres					
There is reliable power/electricity					

- 17 To what extent does facilities availabilityaffect the use of ICT in the telecentre in your area?
  - a) To a Very great extent ()
    b) To a great extent ()
    c) To a moderate extent ()
  - d) To a little extent () e) To no extent ()

### **Section F: Product Mix**

- 18 What services are you offered in the telecentres in our area?
  - a) Computers () b) Internet connections () c) Telephones services ()
  - d) Photocopier ()
- 19 Are you satisfied with the quality of Telecentre services in the telecentre in your area?
  - a) Very satisfied ( )
     b) Satisfied ( )
     c) Dissatisfied ( )
     d) Very Dissatisfied ( )
- 20 To what extent do you agree with the following statements on product mix and use of ICT? Use a scale of 1-5 where 5 is strongly agree, 4 Agree, 3 is Neutral, 2 is disagree while 1 isstrongly disagree

Statements		2	3	4	5
The Telecentres do provide opportunities for further improvement of my					
knowledge and skills in using computers					
The cost imposed to use the services at the telecentres is reasonable					
The information provided by Telecentres is Up-to-date					
The Telecentre is always open at a time when I can visit					
The Telecentre information is more relevant to my needs and the local					
needs					
The information provided by the Telecentres is easy to use					
Telecentre management/administrators promotes and encourages equitable					
access to services in my community					

- 21 To what extent does product/services mix affect the use of ICT in the telecentre in your area?
  - a) To a Very great extent ()
     b) To a great extent ()
     c) To a moderate extent ()
  - d) To a little extent () e) To no extent ()

# THANK YOU FOR YOUR PARTICATION

### **Appendix II: Interview Guide**

The interview guide will collect information from the Telecentres leaders and staff in a bid to establish the factors influencing the use of information technology in Kiambu County, Kenya.

## Section A: General information

1. Where is your telecentrelocated?

2. What is your designation? \_\_\_\_\_

3. For how long have you worked in a telecentre?\_\_\_\_\_

## Section B: Factors Influencing Use of Information Technology in Telecentres

4. Do you think computer skillsamong community members affect the use of ICT in the telecentre in your area? Explain

5. Does the location of the telecentre in your area affect the use of ICT? Explain

6. Are there adequate facilities in your telecentre? Do you think the facilities available affect the use of ICTinyourtelecentre? Explain

7. What services do you mostly offer in the telecentres?

8. Do the services offered in yourtelecentreaffect the use of ICT? Explain

## THANK YOU FOR YOUR PARTICATION