

**EFFECTS OF ACCESS TO INFORMATION
COMMUNICATIONS TECHNOLOGY TOOLS ON
WOMEN PARTICIPATION IN DEVELOPMENT IN
KITALE MUNICIPALITY IN KENYA**

CHRISTINE GATWIRI GAKURE

**MASTER OF SCIENCE
(ICT Policy and Regulation)**

**JOMO KENYATTA UNIVERSITY OF
AGRICULTURE AND TECHNOLOGY**

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**Effects of Access to Information Communications Technology Tools on
Women Participation in Development in Kitale Municipality in Kenya**

Christine Gatwiri Gakure

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Science in ICT Policy and Regulation in Jomo Kenyatta University of Agriculture
and Technology**

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DECLARATION

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

Signature.....

Date

Christine Gatwiri Gakure

This thesis research has been submitted for examination with our approval as university supervisors.

Signature.....

Date.....

Prof. Maurice Sakwa
JKUAT, Kenya

Signature.....

Date.....

Prof. Waweru Mwangi
JKUAT, Kenya

DEDICATION

I dedicate this thesis to my parents:

My mom, Catherine Gakure, for your prayers and encouragement every step of the way.

My dad, Geoffrey Gakure, for believing in me and standing by me at all times.

I owe you an enormous debt of gratitude.

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LIST OF ACRONYMNS

ICT	Information Communications Technology
K-NICE	Kenya National Institute of Civic Education
MDGs	Millennium Development Goals
NGO	Non-Governmental Organization
SMS	Short Message Service
ST&I	Science Technology and Innovation
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behavior
UNCST	United Nations Commision on Science and Technology
UNCSW	United Nations Commision on the Status of Women
UNDP	United Nations Development Program
UTAUT	Unified Theory of Acceptance and Use of Technology

DEFINITION OF KEY TERMS

Development	This is a multifaceted process, where success cannot be reached without the interplay of all actors in political, social and economic field (Kim, 2013).
Political Development	The durable shift in ideas or institutions that alters the feasible set of options open to solving political problems (Kim, 2013).
Social Development	These are efforts of prioritizing human needs in the growth and progression of society (Kim, 2013).
Economic Development	These are efforts that seek to improve the economic well-being and quality of life for a community by creating and/or retaining jobs and supporting or growing incomes and revenue (Kim, 2013).
Universal Access	The ability of all people to have equal opportunity in participating and benefiting from the political, social and economic opportunities of society, regardless of their social class, gender, ethnicity, background or physical and mental disabilities (ITU,2011).
Universal Service	When every individual or household can have service, using it privately, either at home or increasingly carried with the individual through wireless devices (ITU, 2011).

Affordability	The real cost of access, ranging from costs related to the use of ICTs beyond the initial purchase of the technology which need to be affordable. These might include costs relating to installation, rental services for telephone calls, internet provision, electricity and maintenance. It is important that all factors are taken into account when considering and reducing the cost of access (ITU, 2011).
Availability	ICT service is available to all inhabited parts of the country through public, community, shared or personal devices (ITU, 2011).
Accessibility	All citizens can use the service, regardless of location, gender, disabilities and other personal characteristics (ITU, 2011).
Internet Governance	The evolving policies and mechanisms under which the Internet community's many stakeholders make decisions about the development and use of the Internet (ITU, 2011).
Information Society	A society where the creation, distribution, use, integration and manipulation of information is a significant economic, political, and cultural activity (ITU, 2011).

ABSTRACT

The purpose of this study was to measure the effects of the three components of universal access to Information Communications Technologies which are affordability, accessibility and availability on women's participation in development as well as the effects of personal characteristics on women's use of ICTs for participation in development in Kitale Municipality. The study adopted a descriptive survey research design and a random stratified sampling technique. The target population was 37,701. The sample size was 390. The stratification was done on the basis of the 10 civic wards in Kitale Municipality. Data collection instrument was a structured questionnaire. Data analysis was done with SPSS statistical analysis software. The study established that affordability was not a significant factor in determining use of ICT in development by women. Availability of ICTs was significant in affecting use of ICT tools for development. Accessibility of ICTs was significant in affecting use of ICT tools for development. In personal characteristics education was most significant in affecting use of ICTs for development. The study findings were that the most significant variable was accessibility, while the least significant variable was affordability. Among the individual characteristics the study found education to be the most significant. The study concluded that increase in availability of ICTs, education and accessibility of ICTs had a positive impact on women's participation in development while affordability did not. Recommendations from this study include that the ICT policy of Kenya should be gender specific as currently all the ICT policy documents are gender neutral. Recommendations on areas for further research include a comparative study on the effects of access to ICTs on women's participation in development in urban and rural areas.

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter covers the background of the study, statement of the problem, objectives of the study, research questions, justification, scope and limitations of the study.

1.2 Background of the study

During the 47th session in 2003, the United Nations Commission on the Status of Women considered women's participation in development and access to the ICTs as the key instrument for the advancement of women's empowerment (United Nations Commission on the Status of Women, 2003). Access to ICTs has been considered for the last decade imperative in facilitating participation of women in political, economic and social development and bridging the gendered digital divide (UNDP, 2013). In achieving Kenya's Vision 2030, it was imperative to determine the role of access to ICTs as a driver of inclusive participation in development and hence the need for the study.

There are, however, challenges to women's access to ICTs and women's participation in development. In 1995, the United Nations Commission on Science and Technology for Development conducted research for the 4th World Conference on Women and identified significant gender differences in access to, control of and advantages accruing from a wide range of technological developments (UNCST, 1995) then concluded that the information revolution appeared to be by-passing women (Primo, 2003). This gendered digital divide goes to 19.1% against Rwanda's 63.8%, South Africa 44.8%, Tanzania 36% and Uganda 35% this goes hand in hand with an alarming underrepresentation in all spheres of development of women in Kenya. For example, Kenya's female political representation currently stands (UNDP, 2013). According to Kenya Institute for Public

Policy Research and Analysis (2013) in the agricultural sector which is a major economic sector in Kenya hiring 70% of the country's laborforce, women provide 80% of the labor. In Kitale Municipality the main economic activities are agricultural revolving around large scale farming of wheat and maize. These creates over 90% of Kitale's jobs and 90% of its income, women comprise 75% of the workforce yet earn less than 10% of the income generated in this sector.

To bridge these glaring disparities, the 23rd special session of the general assembly recognised that increased access to Information Communications Technologies provided women with new opportunities for participation in development (UN, 2006). The problem of inadequate ICT access for women exists and needs to be addressed urgently. According to Gillwald and Deen Swarray (2013) gender disaggregated data on use of and access to ICTs collected from Kenya, Uganda, Tanzania, Rwanda, Nigeria, Ghana, Mozambique, Namibia, Botswana and South Africa indicated that women and men are not equally able to access and use ICTs. Women generally have less access to ICTs and use them sub-optimally and this increases as the technologies and services become more sophisticated and expensive. With the exception of Botswana, Tanzania, Namibia and Cameroon, computer use and ownership, mobile adoption and internet access was lower among women in all the countries surveyed with Kenya and South Africa having the highest gender disparities.

According to Doria (2012) income and education disparities are key contributory factors widening the gender digital divide as well as affordability of data services. The internet which has a pervasive influence on today's political, social and economic development should be held as a public good, with access as a right. However, the Internet Governance Forum 2011 in Nairobi released a declaration which expressed concern about companies' efforts to control the internet and privatize it, limiting its access, its openness and inclusiveness (Kelly & Cook, 2011).

Overall, ICTs are grouped under two categories: traditional and new. Traditional or

old ICTs constitute non- electronic media such as print and analogue technologies, i.e. radio, television, fixed line telephones, and facsimile machines. These technologies have been gradually ingrained in the daily lives of people and communities. New ICTs consist of computers in all their myriad manifestations and data processing applications accessible through their use such as email, Internet, word processing, cellular phones, wireless technologies and other data processing applications (Gurumurthy, 2004).

According to International Telecommunications Union statistics in Facts and Figures (2011), the most accessible ICT tool is the mobile phone. 86.7% of the world's population owned a cell phone. Only 10% of the world's population had no cell phone coverage and there are regions in the world where there are more mobile phone subscriptions than inhabitants, this is in Russia, Europe, and the Americas. The gap is still important in Africa, where only 53% own a cell phone, though the number of cell phone users is increasing rapidly. Across all countries a woman is 21% less likely to own a mobile phone than a man. This figure increases to 23% if she lives in sub-Saharan Africa, 24% if she lives in the Middle East and 37% if she lives in South Asia. Mobile phones were still identified as holding the greatest potential for opportunities for increased ICT access among women in developing countries. The study showed that ICT is acquired via private or public internet access, relevant content available on the internet, effective communications infrastructure and networks, by purchasing them from service providers and suppliers of ICTs, public-private partnerships to equip institutions that may not afford ICT acquisition such as schools in rural areas, social halls and telecenters, innovative applications. Plo (2012) agrees that mobile phones have become the primary means of communication particularly in countries with poor telecommunications infrastructure.

The range of ICT tools available to women in developing countries include laptops which are preferred by some women due to the portability and usability of these devices which is nearly as good as with a desktop computer, with an increased flexibility for power since it has a battery that can last for several hours even with no direct power

supply and relatively resistant to operating environmental conditions such as dust, temperature and humidity. Personal Digital Assistant, Smart phones and Ultra Mobile Personal Computers remain in the highest price range of all the devices considered, being quite delicate to work with in harmful operating conditions. However, they still remain a favorite with some women because they count with battery and low consumption components and their usability is greater than the basic mobile phones but are worse than devices with bigger screens and keyboards. Another segment of female consumers find that desktop computers and modems are logically the most adequate for accessing internet content and services because Internet is designed for them. On the other hand, their requirements of power and operating conditions are among the most restrictive ones of the devices considered (Global System for Mobile Communication, 2006).

According to Kim (2013) development can be interpreted as the processes of progress and growth in a society. Development in the context of this study refers to social, economic and political development in Kenya which was guided by the Kenyan government's strategic roadmap Vision 2030 and its three pillars: the social, economic and political pillars (Ministry of Planning and National Development Kenya, 2007).

Under the social pillar of Kenya's Vision 2030, the overall goal is investing in the people of Kenya in order to improve their quality of life by building a just and cohesive society enjoying equitable social development in a clean and secure environment. Under the training and education sector women would gain skills through access to computers, learning facilities and training on ICTs through teacher ICT training programs and computerization of schools. Under the health sector there are plans to implement Community Based Information systems and under the housing sector, plans to establish Housing Technology Centers in each constituency (Ministry of Planning and National Development Kenya, 2007).

Under the economic pillar of Kenya's Vision 2030, the overall goal is to maintain a sustained economic growth of at least 10% per annum from 2012 onwards. ICT is seen as

one of the major drivers of achieving Vision 2030. One of the targets is availability of ICT enabled services by improving ICT infrastructure, reducing cost of data, increasing access to mobile phones, internet, televisions and radios per household. Women would, as a result of this, increasingly find ICTs to be more accessible and affordable. While under the financial services sector women would find it easier to access financial services including loans and savings regardless of their location or income (Ministry of Planning and National Development Kenya, 2007).

Under the political pillar of Kenya's Vision 2030, the overall goal is to have an issue based, people centered, results oriented and accountable democratic political system. Under constitutional reforms, the new Kenyan Constitution has ensured that women participate increasingly in electoral and political process. In the National Assembly with 290 members elected from constituencies, a total of 47 are women elected, every county therefore has a woman representative in parliament. During elections, women can also check on voter registration status done via a biometric system through short message service to the Independent Interim Election and Boundaries Commission and get election results and updates regardless of their location by subscribing to information services on their mobile phones (Ministry of Planning and National Development Kenya, 2007).

According to Step Nova (2011) access to ICTs acted as a catalyst of broad participation in socio-political and economic development for the masses in the Arab Spring, access to ICTs in the form of social media networks played an important role in the participation of the largely economically marginalized citizenry in political developments that led to the rapid disintegration of two totalitarian regimes, in Tunisia and Egypt. This then contributed to sociopolitical mobilization in Bahrain and Syria. In Egypt, the sociopolitical gap between the small ruling elite and the bulk of the population had long reached critical levels. Widespread access to ICTs led to protests that were kick started by a Face book campaigns run by the opposition dubbed April 6 Youth Movement which generated tens of thousands of positive responses to the call to rally against government policies. Increased access over the past decade to fast scalable real-time internet-based

information and communication tools were precursors to the participation of significant numbers of the population, many previously never having been involved in socio-political developments in these countries.

ICTs are a powerful catalyst for the participation of women in social development and the promotion of gender equality (Women 2000 and Beyond, 2005). Arab's women's use of Social Media in Civic Participation through initiatives such as Harass Map launched in December 2010, with the objective to help raise awareness of and tackle social injustices such as sexual harassment of women in Egypt through an SMS reporting and online mapping system and Women 2Drive launched in May 2011 whose objective was to call for women's right to drive in Saudi Arabia (Arab Social Media Report, 2011).

1.3 Statement of the Problem

The overall research problem addressed in this study is that in spite of access to ICTs becoming a key driver for development in developing countries (Doria, 2012) and women and men having different needs and constraints when accessing and using ICTs (World Bank, 2005), gender considerations are rarely the focus of policy makers. Policies that neglect the specific context of the lives of women and men are more likely to fail, since they will not meet the needs of all people equally particularly when the neglected group comprises 50% of the population. This is why the inclusion of gender considerations is critical and needs to be integral to the policy process. The digital divide refers to the increasing access gap between those who have and those who do not have: access to information and communication technologies; access to content that benefits them socially and economically; skills to take advantage of ICT services; the ability to afford to pay for digital services. The gender digital divide hampers women's economic and socio-political progress. In Kitale municipality where the main economic activity is agriculture and women are the bulk of the agricultural workforce reliance on traditional marketing of farm produce does not translate to economic empowerment for women. This is not caused by a lack of demand for their produce but a lack of linkage between small scale

farmers and the market supply chain. Farmers also lack information about prices for their produce and market demand and are therefore vulnerable to exploitation by middle men. Linkages between farmers and markets and information can be achieved through mobile applications on the Kenyan market such as MShamba, MFarm and ESoko, which can be used even on low end mobile phones. These applications connect farmers to buyers and have been able to provide a constant income flow of up to three times what is earned from traditional marketing of farm produce in areas where they have been adopted by farmers (Maumbe & Patrikakis, 2012). Lack of access for women in Kitale Municipality disempowers them greatly economically.

Access becomes essential because exclusion will mean severely limiting life chances (Burbules & Callister, 2000) however there has been little systematic collection of sex disaggregated data on ICT access and use and even less that analyses the descriptive data that exists. Without such analysis, descriptive data is not only incomplete but can also mislead policymakers on the correct points of policy intervention aimed at encouraging greater gender equity in ICTs (Research ICT Africa, 2014). The Solidarity for African Women's Rights Coalition (2010) urged ICT policy makers to ensure that decisions taken when developing national ICT policy frameworks do not ignore women's specific experiences, and adopt specific measures to advance women's access to and use of ICTs as a matter of urgency due to the rapid technological transition in the global knowledge society. In as much as one of the key principles guiding the implementation of the Kenyan ICT Master plan launched in April 2014, is equitable and non-discriminate availability of and access to ICTs across County Governments, urban and rural areas, and gender lines, of the numerous desired outcomes and strategies for meeting the stated objectives, none is gender specific and gender transformational (The Kenya National ICT Master plan, 2014)

Without aggressive policy interventions to bridge the gender digital divide, there will be no way of achieving Kenya's Vision 2030 of creating a globally competitive and prosperous nation with a high quality of life for all its citizens by 2030 as women

constitute half of the Kenyan population. Lack of equitable access to ICTs and consequently lack of participation of women in the national development agenda holds back growth of individuals, the development of countries and evolution of society (UNDP, 2013). ICT is a priority for development and therefore requires national level strategies and support in tandem with Sessional Paper No. 2 of 2006 on Gender Equality and Development which states that it is the right of women, men, girls and boys to participate in and benefit equally from development initiatives. The focus of the study was on determining the effects of access to ICT tools on women's participation in economic, social and political development in Kitale Municipality in line with the ICT for Development (ICT4D, 2014) components access to ICTs, ability to use ICTs, actual use of ICTs and impact of using ICTs.

1.4 Objectives of the Study

1.4.1 General Objective of the Study

Determining effects of access to ICT tools on women's participation in development in Kitale Municipality.

1.4.2 Specific Objectives of the Study

- 1) To determine effects of affordability of ICTs on women's participation in development in Kitale Municipality.
- 2) To determine effects of availability of ICTs on women's participation in development in Kitale Municipality.
- 3) To determine effects of accessibility of ICTs on women's participation in development in Kitale Municipality.

4) To determine effects of personal characteristics including age, education level and employment status on women's participation in development in Kitale Municipality.

1.5 Research Questions

- 1) What are the effects of affordability of ICTs on women's participation in development in Kitale Municipality?
- 2) What are the effects of availability of ICTs on women's participation in development in Kitale Municipality?
- 3) What are the effects of accessibility of ICTs on women's participation in development in Kitale Municipality?
- 4) What are the effects of personal characteristics such as age, education level and employment status on women's participation in development in Kitale Municipality?

1.6 Justification of the Study

The study aimed to fill the gap in the knowledge on what development issues women use their ICT tools to participate in as was this not clearly researched and documented on. The available studies are on earlier forms of ICTs such as television, radio and print media while studies on digital ICTs and social media were lacking. The study advised policy makers on women empowerment towards ICTs, based on findings from the study. This study aimed to show significance of access to ICTs in relation to inclusivity and women's participation in development so as to encourage stakeholders and policymakers to prioritize concerted efforts towards women's increased access to ICTs.

Use of ICT tools can provide opportunities for women participation in political, economic and social development issues and address long standing challenges faced by women such as the legal and customary barriers to ownership of and access to land, use of natural resources, access to capital and credit. Increased access to ICTs can also be tools to

alleviate lack of opportunities, resources, training and skills, access to technology, as well as wage differentials which all stand in the way of the economic empowerment of women. Opportunities through use of ICT tools to interact with their elected representatives and to lobby to various organs of government such as treasury and judiciary to enact and enforce legislation to review property ownership laws and remove constraints of customary law systems, ensure gender balanced budgetary allocations and expenditure bearing in mind the unequal impact of poverty on women. The use of ICT tools would help the women achieve the above and participate actively in development at all levels. Access to ICTs could increase women's independence, social status, networks, social capital and self confidence enabling them to reflect on their role in a global society. Women's access and use of digital ICTs could enable them access new opportunities in the public sphere, such as online education and business services.

The study has assisted in coming up with information that will help in strategies to enhance women participation in development through access to ICTs. The study also aimed to avail the outcome of this study to the stakeholders such as The ICT Authority of Kenya, The Communication Authority of Kenya, Kenya National Institute of Civic Education (K-NICE), The Judiciary, The Government and policy makers so that they can engender the ICT Policy with the aim of bridging the Gender Digital Divide with the aim of enhancing participation of women on development issues. Policy makers can then prioritize the affordability of ICT tools, the internet and consequently, compel telecoms to lower their data tariffs.

The researcher chose the study area in the interest of devolution of ICT policy in the area of bridging the gendered digital divide informed by research done in non-urban area because of the urban rural divide that also adversely affects those citizens who do not live in urban areas. The researcher also wanted to find out if and how ICT tools are enhancing women's participation in development in Kitale Municipality.

The information that has been gathered through this study would assist the Government

and its various organs and policy makers to develop development initiatives to better reach, communicate and serve the female populace especially those in rural and peri-urban areas essentially devolving them via these initiatives. The envisioned initiatives aimed at bridging the gaps observed as an outcome of this study is hoped to bring Kenya closer to achieving the Sustainable Development Goal 5 of empowering women. The study has provided empirical evidence on use of ICTs in development.

1.7 Scope of the Study

The study was conducted in Kitale Municipality, Trans-Nzoia County; Rift-Valley Province in Kenya. Random stratified sampling was used to obtain a representative sample. The study focused only on New ICTs which consist of computers in all their myriad manifestations and data processing applications accessible through their use (email, Internet, word processing, cellular phones, wireless technologies and other data processing applications). The study targeted women who are eligible to vote and up to retirement age as stipulated by Kenyan constitution. It focused on development issues affecting the Kenyan female electorate. The data was collected through structured questionnaires. The nature of the data collected was both quantitative and qualitative.

1.8 Limitations of the Study

Getting women to open up and speak candidly about their access and use to ICT tools was challenging since this was personal and sensitive information the women were apprehensive towards the data collection team. The researcher overcame this limitation by rapid rapport building on other issues that were non-threatening before delving into the focus of the study, giving respondents snacks, assuring the respondents of confidentiality of their identities and of the outcome of the research being beneficial to them and to their communities.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the literature related to the effects of access to ICTs on women's participation in development. Digital ICTs and women's empowerment is a new field of enquiry, gaps in the literature and analysis identified the need for more systematic research on this topic. It was done from desk top review, previous studies and research, journals, textbook, internet review and practical experience by the researcher. This literature review took a thematic approach organizing the review around topics and issues. Analysis of literature took one of two forms. Multiple sources were used during the literature review process to ensure representation and legitimation. Representation refers to the ability to extract adequate meaning from the information at hand by combining the information from various sources in order to understand better the phenomenon, in turn, enhancing the quality of syntheses. Using the seminal framework of Greene, Caracalla, and Graham(1989),there are four major ways in which representation was enhanced by using multiple sources in this review: between-source triangulation i.e., seeking convergence and corroboration of information from different source types ;between-source complementarity i.e., seeking elaboration, enhancement, illustration, clarification of the information from one source type with information from another source type; between-source development i.e., using the data from one source type to help inform data from another source type ;and between-source expansion i.e., seeking to expand the bread than the range of information by using different source types for different pieces of information.

Legitimation refers to the credibility, trustworthiness, dependability, confirmability and /or transferability of syntheses made (Denzin & Lincoln,2005).The two major ways in

which legitimation was enhanced by using multiples sources in this review were: between-source triangulation i.e. assessing level of convergence and corroboration of information extracted from different source types and between-source initiation i.e. discovering paradoxes and contradictions that lead to a re-framing of the synthesis. This review employed qualitative data analysis techniques: keywords-in-context, theme analysis, secondary data analysis, qualitative comparative analysis, narrative analysis and text mining (Leech & Onwuegbuzie, 2008). All sources were evaluated for credibility, validity, plausibility, transferability and objectivity. The review focuses on the following areas: Information on ICT accessibility, affordability, availability and uses across diverse regions, gender and socio-economic groups, it also reviewed various theories on access to and adoption of ICTs and participation in development. It looked at women's participation in social, economic and political development in line with Kenya's Vision 2030 and Millennium Development Goal 3 of achieving gender equity and empowerment of women.

2.2 Theoretical Review

In examining the existing theories of effects of ICT access on women's participation in development, this researcher found that no model fully covered the variables in the study and therefore combined and enhanced the existing models to develop a comprehensive framework for the study.

2.2.1 Access to ICTs

The term ICTs has been used to encompass technological innovation and convergence in information and communication leading to the development of so-called information or knowledge societies, with resulting changes in social interaction, economic and business practices, political engagement, education, health, leisure and entertainment. There has been a growing understanding that these technologies can be powerful instruments for advancing economic and social development through the creation of new types of

economic activity, employment opportunities, improvements in health-care delivery and other services, and the enhancement of networking, participation and advocacy within society. ICTs also have the potential to improve interaction between governments and citizens, fostering transparency and accountability in governance. While the potential of ICT for stimulating economic growth, socioeconomic development and effective development is well recognized, the benefits of ICT have been unevenly distributed along gender lines (Sreedevi & Reddy, 2012).

According to ICT Regulation Tool Kit (2008) Universal access (UA) is when everyone can access the service somewhere, at a public place, thus also called public, community or shared access. Universal service (US) describes when every individual or household can have service, using it privately, either at home or increasingly carried with the individual through wireless devices.

The three hallmarks of Universal Access and Universal Service are:

Availability: the service is available to all inhabited parts of the country through public, community, shared or personal devices;

Accessibility: all citizens can use the service, regardless of location, gender, disabilities and other personal characteristics; and

Affordability: the real cost of access, ranging from costs related to the use of ICTs beyond the initial purchase of the technology which need to be affordable. These might include costs relating to installation, rental services for telephone calls, internet provision, electricity and maintenance. It is important that all factors are taken into account when considering and reducing the cost of access.

Access is defined as the ability to make use of the information and the resources provided. The factors identified as constraints to access, i.e. poverty, illiteracy, including computer illiteracy, and language barriers are particularly acute for women. Further

women are less likely to own communication assets such as phones and computers. This therefore confirms that women's access to ICT is constrained by factors that go beyond issues of technological infrastructure. Socially constructed gender roles and relationships therefore play a key role in determining the capacity of women to participate in the information society and development (Sreedevi & Reddy, 2012)

Van Dike (1999) distinguishes four successive kinds of ICT access: the first is mental access which is the elementary digital experience, interest and motivation and unattractiveness of new technology. The second is material access which is possession of computer and network connections. The third is Digital skills access which is the technological education, user friendliness and social support. The fourth is usage access which is usage opportunities and their distribution. On the other hand, Kling (1998) identified differences in technical access (the physical availability of the technology) and in social access (the professional knowledge and technical skills necessary to benefit from information technologies).

According to Czerniewicz and Brown (2005) concepts of the digital divide which refer to the differences in resources and capabilities to access and effectively utilize ICT for development that exists within and between countries, regions, sectors and socio-economic groups and theories of access to ICT have evolved beyond a focus on just physical access to computers and the separation of the haves and the have not's to include more such as availability, connectivity and affordability of technology and whether the technology is appropriate for the role it is supposed to play. Researchers have started considering the conditions or criteria for access and broadened the concept by including additional components. Terms such as real access, thick conceptions of access and social inclusion give some indication as to the change in thinking about access to ICTs. More recently, the definition of digital divide has further evolved to encompass the results of the use of such technologies. Norris (2001) pointed to divides at three levels: the global divide which encompasses differences among industrialized and lesser developed nations; the social divide which points to inequalities among the population within one nation;

and, a democratic divide which refers to the differences among those who do and do not use digital technologies to engage and participate in public life. DiMaggio and Hargittai (2001) suggested five dimensions along which divides may exist: technical encompassing software, hardware and connectivity quality; autonomy of use encompassing location of access, freedom to use the medium for one's preferred activities; use patterns meaning types of uses of the Internet; social support networks encompassing :availability of others one can turn to for assistance with use and size of networks to encourage use; and lastly skill meaning one's ability to use the medium effectively. Bridges (2001) postulates that real access goes beyond physical access to bridge all aspects of digital divide, he provides an assessment of the existing access-divide in the world. Access-divide comprises, among others: income divide; telecommunication access-divide; education access-divide; language and content access-divide; lack of access to the people with disability; gender access-divide; and rural-urban divide. Access means not only access to technology but also access to information and know-how.

Access is affected by age, class, gender, race or by one's socio-economic status. The most basic quantitative indicator of access is the number of women and men who have access to computers, telephones and the Internet. The factors affecting this access are usually the presence or absence of telecommunications and Internet infrastructures. However, quantitative indicators of access are only the starting point. The more significant indicators are often qualitative in nature. These include the quality of access to information that is useful, empowering and relevant for women. According to (Burbules & CallisterJr.2000), thick conceptions of access ask not only access for whom but access to what and for what purposes? ICTs do not have any meaning in isolation - they have meaning only in relation to an implicit or explicit purpose. That purpose is the way they acquire meaning; this in turn contextualizes them. Some researchers stress the economic importance of ICT in development (Jarboe, 2001). Others foreground the democratic and citizenship possibilities which ICTs enable, and prefer the term knowledge democracy rather than a knowledge economy because of the participatory and social dimensions with which ICTs are increasingly associated (Garnett and Rudd, 2002). Indeed, access to ICTs

is considered a basic right of 21st century citizenship (Murdoch 2002). Access becomes essential because exclusion will mean severely limiting opportunities available (Burbules & Callister 2000).

The International Telecommunications Union has suggested that a country's transition toward an information society can be described in a three stage model (ITU, 2011). The first stage corresponds to what has been called the ICT readiness phase, reflecting the level of network infrastructure and access to ICTs. The second stage refers to ICT intensity or the degree to which ICTs are being used by the society at large. The third stage relates to ICT impact: the capacity to obtain adequate benefits from the effective use of ICTs.

On affordability of ICTs, scholars theorize that ICTs have many hidden costs that make it unaffordable especially in the developing world. As Kling (1999) observed, the total costs of ownership of technologies such as computers has been shown to be a fraction of initial equipment costs - with training, upgrading and reconfiguration proving to be the major costs over time.

On availability of ICTs, some theorists argue that the mere availability of ICTs spurs use of ICTs and is even the key to development in society however many others claim that use of the available ICTs is driven by the economic, sociopolitical state of a society and while others claim it's a reciprocal. The technological determinism theory (Bradley ,2005) posits that a society's technology drives the development of its social structure and cultural values implying that technology is the key mover and determinant in history and social change .This theory is validated by the experience of use of ICTs to mobilize masses including women in the conservative middle eastern cultures to protest publicly against oppressive regimes such as in the Arab Spring previously unheard of before the advent of social media and proliferation of expansive use of ICTs and availability of data services. However, the neutrality theory (Kaptelinin & Nardi, 2006) differs arguing that technology has no particular consequences for social organization and the non-technical

aspects of culture. The critical theory (Zhang, 2008) however posits that technology development is determined by both technical and social criteria of progress and therefore that the process of adaptation between social institutions and technological development is reciprocal. As does the rhetorical theory of technology (Warnick, 2002), which argues that technology transfer is an interactive and reciprocal process.

On accessibility, scholars posit that ICT skills alone are not enough but about perceptions on the functionality of ICTs, in women's day to day life. In the area of ICT adoption, Pederson (2003) claims that studies in this area have taken 3 approaches. The first being diffusion approach, from Roger's Diffusion of Innovation theory (cited by Van Akkeren & Harker, 2003, p205) comprises four elements: invention, diffusion through the social networks, time and consequences and adoption determinants include relative advantage if technology is perceived as better than its alternatives or the idea it supersedes alternatives, or has more compatibility to the user's needs. The profile of the late adopter of technology is predominantly female.

The second is the adoption approach which describes and explains the adoption decision of users applying different individual and social decision making theories. Three widely used models include the Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA), and the extension of TRA into a Theory of Planned Behavior (TPB)(Pedersen, 2003). The TAM presented by Davis (cited by van Akkeren and Cavaye, 1999) suggests that when a user is presented with a new technology, a number of factors influence their decision regarding how and when they will use it. This includes its perceived usefulness and its perceived ease of use. The TRA model includes four general concepts namely: behavioral attitudes; subjective norms; intention to use; and actual use of ICTs. The TPB is an extension of the TRA and deals with conditions where the individual has no control over their behavior. The Unified Theory of Acceptance and Use of Technology (UTAUT). Venkatesh et al. (2003). The purpose of UTAUT is to explain a user's intentions to use ICT and the subsequent user behavior. The model considers four constructs as direct determinants of user acceptance and usage behavior, namely

performance expectancy which is using technology will assist users perform some of their daily tasks, effort expectancy, social influence, and facilitating conditions.

The third being the domestication approach focuses on the process in which technology becomes an integral part of our everyday habits. This view is dominated by sociologist researchers and is often characterized by demographic variables such as age and gender (Pedersen, 2003). The theory however is limited as it excludes perception, attitude and design.

A distinct body of psychological work has emerged looking at individuals who make little or no use of technology. Although exact definitions vary, the phenomenon of technophobia is considered by social psychologists to encompass the fear and apprehension felt by an individual when considering the implications of using technology, even when it poses no real or immediate threat. In other words, technophobia clouds an individual's perception of the technology in question, making it appear somehow not for them. From this perspective we approach non-use of ICT primarily in terms of understanding the perceived needs of the individual Kenyan woman rather than the perceived needs of their teachers, future employers, government or society. This involves accepting that women are more than simply end users with no role to play in the technological process beyond accepting ready-made technological artifacts.

There are processes underlying how technologies are consumed and used. Theories in this area include the Soft Systems theory (Checkland, 1981) which argues that for an ICT solution to be viable, social and political elements that confound the problem definition and resolution must be taken into account, as much as the technical functionality, the Task Technology Fit Theory (Goodhue et al, 1995) holds that access to ICTs is more likely to have a positive impact and be used if the capabilities of the ICT match the tasks that the user must perform. These theories point to the use of ICT to resolve user's problem more so the socio-political aspects of the user's needs as well as assist the user perform tasks as a key indicator of viability and hence use of ICTs that become available

to users. The Social Construction of Technology Theory (Pinch & Bijker, 1984) argues that different social groups evaluate and interpret success or failure of technology based on their objectives, goals and intentions. Likewise, the Adaptive Structuration Theory (DeSanctis & Poole, 1994) criticizes the techno centric view of technology use and emphasizes the social aspects because groups create perceptions on the role and utility of ICTs which influence use of ICTs and subsequent outcomes on the groups. This then means that women's perception of the role ICTs in their day to day lives greatly influences their use of ICTs and the resultant outcomes as a group, this theory is important in understanding social factors creating the gender digital divide. As does the ambivalence theory (Zhang, 2008) which posits that technology is contextualized and as a result either accepted or rejected based on cultural, socio-political and economic state of a society. These theories however underestimate the impact of technology on these facets of a society and the capacity of technology to frog leap a society to other stages of socio-political and economic growth.

2.2.2 Women Participation in Development

Development recognizes the blurring of boundaries and responsibilities for tackling social and economic issues, a citizenship that emphasizes rights and responsibilities is also part of an emerging consensus. It draws to our attention a shift in responsibility, a stepping back of the state and a concern to push responsibilities on to the private and voluntary sectors and, more broadly, the citizen. Development is connected to the concern about social capital and the social underpinnings necessary to effective economic, social and political performance. Development is a multifaceted process, where success cannot be reached without the interplay of all actors in political, social and economic field (Putman, 1993).

According to Kenya's Vision 2030 (Government of Kenya, 2011) the Medium Term Plan identified the need to address gender concerns for the country to attain sustainable development. It recognized that gender disparities in Kenya must be addressed with the

objective of ensuring equity between men and women in access to social, economic and political opportunities. This is in line with Millennium Development Goal Number 3 on gender equality and women empowerment.

Examples of women's participation in development thanks to access to ICTs include the E-Seva programme in India which showed economic benefits for the women trained in managing the ICT kiosks (Karan & Raj Mathur, 2010). An initiative in South Africa used an online platform to encourage girls to engage policy makers on access to transport and employment and over public spaces where they felt safe to meet to socialize (Klugman et al., 2014). Women in Indonesia who were trained in ICT skills gained greater status in their village but were also asked to take on administrative tasks for the local elites (Jahaj, 2013). A Peruvian women's movement used social media to provoke government actions on sexual harassment by gathering data on crimes (Bossio & Bossio, 2013). In South Africa women campaigned online to keep a women's shelter open in Cape Town (Mudavanhu & Radloff, 2013) In Brazil, a program that coordinates services for pregnant women used online data to monitor and coordinate health provision resulted in a rise of women attending all recommended prenatal visits rising from 10% to 80%. In Togo an association of rural women's organizations in Togo used mobile phones to create learning networks for property rights education. In Kenya, online services provide confidential and reliable information on sexual and reproductive health which is a cultural taboo to girls. (Gurumurthy & Chami, 2014)

2.2.3 Women Participation in Social Development

According to Kenya's Vision 2030(Government of Kenya, 2011) in the education and training sector, the Government's strategic thrusts in this sector are to enhance access to all levels, quality, equity and science, technology and innovation. Research in the area of women's participation in socio-economic and political development have mainly aimed to illuminate gender disparities, not to explain or theorize why these disparities have arisen and continue to exist and how they can be resolved. Examples of this

include investigations of women's vs. men's access, use, uptake and acceptance of ICTs.

The observed gender differences are then interpreted as originating from the opposing gender roles that, in turn, are assumed to generally derive from bio-psychological differences and therefore much of this research is based on negative assumptions about women such as that women are naturally less technologically competent than men (Wajcman, 1991). However, the gendered aspects of ICT use, have not considered from the perspective of those experiencing it. Some research focuses on developing a better understanding of how these gender differences in ICT use came about. This research invokes such theories as social construction (e.g., Nielsen, von Hellens, Greenhill, & Pringle, 1998; Tapia, 2003) or individual differences (Trauth, 2002; Trauth, Quesenberry, & Morgan, 2004) in developing theoretical explanations that incorporate social influences underlying inequality between the genders. It is directed at coping with the dynamics of inequality, not challenging the legitimacy of underlying social influences or undoing them.

Some researchers in discussing access to ICTs focus mainly on the value of social equity and inclusion. Warschauer (2003), for example, argues that the very resources that people need access to are the same resources to which they will be able to contribute. Thus access and use are closely inter-related: access to resources and the creation of resources are inter-dependent. Similar to Critical Social Theory (Adam, 2002) which states that although people can consciously act to change their socio-economic circumstances, this ability is in equal measure constrained by various forms of social, economic and political domination. Doolin (1998) argued that a research approach based on the critical theory is needed in order to view information technology within a broader context of social and political relations. The social nature of activities associated with the development, implementation, ICTs and the management of people who carry out these activities leads naturally to considerations of social and political power.

Comparative theories of ICT that relate to social development include Social Informatics which places social shaping of technology as the central tenet (Kling 2000; Loader & Keeble 2004:39; Taylor 2004; Schuler 1996), where looking at what people do with technology rather than what they have is pertinent for making effective use of ICTs for social change and social inclusion and Community Informatics suggests that ICTs enable community processes and the achievement of community objectives including overcoming digital divides both within and among communities (Gurstein, 2002). The two theories are among the key theories informing this study.

The UN Global E-Government Development Report (2005) points to the need to align development thinking with the paradigm of the socially inclusive development. This would be a multi-pronged approach to promoting ICT-led real access which according to Bridges (2001) asks, if technology is part of socio-economic and political development, with a special focus on the benefits of technology to women and the disadvantaged in society. Use of ICTs in government and development can significantly improve the relationship between policy making and service delivery and has implications for such key values as social equality and inclusiveness (King, 2007)

Examples of women's use of access to ICTs for social development include : An Iraqi women's group called Wadi, used online tools to campaign for an anti- female genital mutilation (FGM) law ,to engage rural women and to gather evidence of the practice, this led to the Kurdish regional government enacting new laws that make the practice of FGM a criminal offence (Chua,2013). In China, graphic images of violence against women taken on mobile phones such as the case of a forced abortion of Feng Jianmei in June 2012 stirred public outrage and resulted in the seeking of justice for the victim (Jahaj, 2013).

2.2.4 Women Participation in Economic Development

According to Kenya's Vision 2030 (Government of Kenya, 2011) the financial services sector plays a critical role in the development of the country by providing intermediation between savings and investments. These will be achievable through among others promoting mobilization of savings and access to financial services and providing equal access to financial services.

Access to ICT is a catalyst for economic development and in developing countries like Kenya where women who are half the population lack access to ICTs it's a hindrance to their achieving economic stability .A study done in Kitale Municipality clearly shows that when women access ICTs they participate highly in economic development.(Gakure, Sakwa, & Mwangi, 2016)

According to Rosser (2005), liberal feminism theories would seek to remove barriers that prevent equal access for women to information technology jobs not only to provide economic equality but to provide access to higher-paying jobs for women in contrast to socialist feminism which believes that technology and the social shaping of technology have often been conceptualized in terms of men, excluding women at all levels.

Socialist feminist reform suggests that the allocation of resources for technology development should be determined by greatest benefit for the common good. A growing use of cyber protests to disrupt capitalist enterprises such as the World Bank might be seen by socialists as an example of information technology use for the common good. While radical feminism maintains that women's oppression is the first, most widespread, and deepest oppression.

Radical feminism rejects most scientific theories, data, and experiment not only because they exclude women but also because they are not women-centered. Radical feminism

suggests that because men, masculinity, and patriarchy have become completely intertwined with technology and computer systems in our society, no truly feminist alternative to technology exists.

Cyber feminism which is a woman-centered perspective that advocates women's use of new information and communications technologies for empowerment directly opposes radical feminism theory (Millar, 1998). The term cyber feminism, which explicitly fuses gender and information technology, saw the potential of the Internet and computer science as technologies to level the playing field and open new avenues for job opportunities and creativity for women where absence of sexism, racism, and other oppression would serve as major contrasts between the virtual world and the real world. While postmodern feminist theories imply that no universal research agenda or application of technologies will be appropriate and that various women will have different reactions to technologies depending upon their own class, race, sexuality, country, and other factors. This definition of postmodern feminism parallels the description of the complex and diverse co-evolution of women and computing. In contrast to liberal feminism, postmodernism dissolves the universal subject and the possibility that women speak in a unified voice or that they can be universally addressed.

It is widely believed that entrepreneurship is beneficial for economic development. Gries and Naudé (2011) define entrepreneurship as the resource, process and state of being through and in which individuals utilize positive opportunities in the market by creating and growing new business firms. Schumpeter (1950; 1961) famously defined the entrepreneur as the coordinator of production and agent of change. As such the entrepreneur is seen mainly as an innovator. Scholars who share this view of entrepreneurship do not consider entrepreneurship to be very important in earlier stages of economic development – they see the contribution of entrepreneurship to be much more important at later stages of development, where economic growth is driven by knowledge and competition. At earlier stages of development, entrepreneurship may play a less pronounced role (Ács & Naudé, 2013). However other scholars are of the opinion

that underdevelopment is not due to an insufficient supply of entrepreneurs, but due to institutional weaknesses that result in a lack of profit opportunities tied to activities that yield economic growth (Coyne & Leeson, 2004).

One of the main tenets of development economics, according to Szirmai, Naudé, and Alcorta (2013) is that development requires a structural transformation of what, how and where production and consumption takes place: from low-value added, low productivity and rural-based activities to more productive, higher value added activities in services and manufacturing located in cities. This tenet exacerbates one of the most challenging digital divides facing developing countries, that of the rural urban divide. This tenet also is in conflict with the Kenyan development model which is moving away from centralization of economic development in the urban areas where development was focused on previously to all-inclusive devolution particularly to the rural and underdeveloped parts of the country .Peretto (1999) growth model implied that long term structural transformation depends on the degree to which an economy can make a transition from a growth path driven by capital accumulation known as the Solow economy to a growth path driven by knowledge accumulation which is the innovation-driven economy.As ICTs are key drivers of innovation ,access to ICTs can then be seen as the key to long term economic development particularly for rural areas which are considered to be where the more low value added and low productivity sectors of the economy are based than urban areas.

Examples of women's use of access to ICTs to participate in economic development include: Domestic Workers in Jamaica, the majority of whom are female, used ICTs to campaign for the adoption of International Labor Organization (ILO) Convention 189.This improved their wages and working conditions (Dunn & Dunn,2013).In Philippines, digitization of public records has helped address structural causes of gender inequality, such as denial of land rights, by requiring that renting of natural resources be recorded as co-owned by husband and wife (Gurumurthy & Chami,2014) .In Afghanistan, a women's education programme teaches women how to use Bitcoin- a

digital currency and software based online payment system, women are paid in Bitcoin for articles and blogs they write, giving them greater control over how they spend their earnings (Antonio & Tuffley,2014). For Muslim women in Nigeria they were able to have direct links with their business partners without compromising their purdah status. While in Guyana women's weavers' society used the internet to sell their handmade hammocks online. Programs in Tanzania and Nairobi have enabled women farmers to use their phones to negotiate directly with buyers. Women's use of M-Pesa in Kenya and Tanzania has increased their control over savings and expenditure, reduced business costs, increased profits and financial security (Domingo et.al 2015)

2.2.5 Women Participation in Political Development

According to Kenya's Vision 2030 (Government of Kenya, 2011) one of the Medium Term Plans in improving electoral and political processes was electronic voter registration, checking by voters via short message service via mobile telephony on voter registration status and details such as polling station, use of ICTs for civic education, tallying and relaying of votes in readiness for the 2013 elections countrywide. Researchers in this area such as Khasiani (2000) have shown how community based resource centers equipped with ICTs can play a key role in informing Kenyans, especially women of critical issues in the electoral process and enhance women's interaction and be used for generating, storing and exchanging strategic information and thus enable women to make informed decisions and participate effectively in the electoral process. Barriers to political participation include high levels of illiteracy especially in hunter gatherer communities, practices that limit freedom of choice in who women elect such as family voting where men coerce family members to vote according to personal wishes and preferences instead of individual ones, running for office for women is financially prohibitive and dangerous due to violence. Leadership among women was a spontaneous process through which gifted and socially accepted individuals evolved to address social issues affecting women. Women could choose amongst themselves those who will preside over issues like marital conflicts and advising girls (Muchemi, 2011). Certain

women among the Ogiek were also recognized for their ability to foretell events and for their herbal knowledge. These women were often consulted widely.

Kenya has got a political government and 52% of the populations is women, 60% of registered voters are women, sustainable development cannot be achieved where over half of its population is not represented in its development structures. Therefore, enhanced women representation in party structures is essential if women are to have an impact in the decision-making process of political parties. Kenyan women's presence and political participation (Sena, 2012) in leadership and governance has a long history dating from pre-colonial through colonial to post-colonial period such as the first woman Chief-Wangu wa Makeri, who defied patriarchal structures of culture and tradition, and rose to become a formidable leader who is said to have brought development and peace among her community. Many unsung heroines accomplished similar feats; including those who actively participated in the country's liberation struggle of the 1940s and 1950s, thus demonstrating that women can and do make a significant difference even in hostile environments. According to Nzomo (2012) since Kenya attained formal independence in 1963, women have been seeking to effectively participate alongside men, in development and decision-making in all aspects of public life. But in the first four decades of post-colonial rule, progress towards women's access to formal political leadership positions, has been slow due to a combination of structural obstacles which include: i) deeply embedded patriarchal socio-cultural values; ii) undemocratic institutions and policy frameworks and iii) low levels of civic and gender awareness. Due to the constricted formal political space, women's political engagement operated outside the State, with minimal support from the largely patriarchal State.

According to the International Telecommunication Union report (Shirazi, 2012). In parts of the world with the lowest women participation in development such as Iran, access to ICTs has played a crucial role in empowering women politically. Since the introduction of the Internet in Iran, Iranian women have used this medium not only as a means of accessing and disseminating information but also as the means of voicing their concerns

about discriminatory laws and to participate in public discourse. In Iran, the Internet provided a voice to repressed and marginalized groups, particularly young people and educated women. Blogging in Iran has helped repressed and marginalized groups reach out, including women's and human rights activists, ethnic and religious minorities and Iranian youth to get their voices heard and to challenge the long standing univocal government and Islamic religious authorities.

According to Nzomo (2012) the high level of illiteracy makes it difficult for women to understand their voting options. In marginalized communities such as the Maasai, the Samburu, and the Turkana, young girls are not sent to school, as their fathers believe that it is a waste of time and money to educate a girl, as her only role will be that of a wife. Loita Maasai women, reported that their husbands retain their national identity cards which is a prerequisite for voting and only hand them over on election day, when they would accompany their wives to the polling station. Raising sufficient resources to fund a campaign for office is extremely difficult, particularly for women who often lack established funding networks or collateral. In Kenya, women who run for political posts face societal opposition, from both male and female citizens. Most opt to drop out of the political race. In some cases, women have turned their stereotyped profiles of motherhood as tools of oppression and subordination to their advantage, and used them to shape and influence the agenda of democratic governance. Such was the February 1992 case of a group of elderly Mothers of Political Prisoners who sustained for several months, an unconventional strategy of public protests against the Kenyan State, combining a hunger strike and publicly stripping naked, as they mobilized support for their demands for the release of their politically criminalized sons. The mothers of political prisoners seized the political space for activism created by the return to political pluralism in Kenya in December 1991 and riding on the energy, resolve and sense of women solidarity emanating from the National Women Convention that had just concluded in Nairobi. Through this novel and public way of lobbying, these women received attention of the political leadership and support from the women movement, Kenyans in general and the outside world. Four prisoners were released in June 1992, and

four more in January 1993. In their own way, these mothers set a gender agenda for women in governance, and provide a demonstration effect to women and society at large, of the many possibilities and strategic avenues that exist for political engagement and for gaining access and influence to and in political leadership (Muchemi, 2011).

Women protests led to raising public and government attention to the dissatisfaction of the citizens with the poor state of governance in the country and also served as a positive tool for strengthening women's voices in mainstream politics and media. Women empowerment is intimately linked to speaking out, taking up the specific demands of women and proposing a public space, thus breaking the silence and openly and publically participating in and contributing to the construction of one's own political spaces and paradigms. Speaking out is not limited to simply speaking per se, but also being heard and the inclusion of their voice and proposals in the spaces of participation and their outcomes in different levels. It also includes the demand to be respected as different, a distinct vision and the autonomy of speaking for oneself (FIMI, 2011). Examples of women use of access to ICTs for political development include: training of indigenous women leaders in Bolivia in ICT skills contributed to increased number of women gaining political positions, use of skype and online platforms enabled indigenous women to communicate easily, widely and cheaply with each other inspiring confidence in women leadership (Wamala, 2012).

2.2.6 Personal Characteristics and Access to ICT Tools

There are three key moderating variables under personal characteristics: age, education level and employment status. Recent studies indicate that technological anxiety continues to correlate significantly with individuals' characteristics, most notably gender and age (Bauer 1995). However other scholars are of the opinion that education level is the most significant personal characteristic in technology adoption. Psychologists weighing in on this discourse point towards a range of cognitive and affective factors as important in determining women's engagement with technology - such as perceived ease of use, self-

efficacy, perceived behavioral control and perceived ability (Zhang, 2008). The complexity of the relationship between causal factors and attitudes is highlighted by the numerous other psycho-social factors that have also been found to correlate strongly with attitudes towards computers. The link between attitudes towards mathematical ability and attitudes towards computers has been explored by studies (e.g. Schmacher *et al* 1993, Miller and Varman 1994, Shashanni 1995). Other studies have also revealed that peoples' creativity level (Offir *et al* 1993), learning and social self-image (Hardey, 2009) and locus of control (Woodrow, 1990) all significantly correlate with their computer-related attitudes. Others theorize that employment status was the personal characteristic with the greatest significance in ICT adoption. On the impact of the economic or employment status of women on use of ICTs, it is agreed by many authors that the most immediate influences on individuals' engagement with ICT are economic and material (Haywood, 1998). As Murdock *et al.* (1996) argue, material resources and economic capacity play a central role in determining (i) whether women use ICTs and then (ii) the nature and subsequent patterns of that use. The economics of gaining access are, therefore, an obvious prohibitive factor to women using ICTs.

In examining the existing theories of effects of ICT access on women's participation in development, this researcher found that no model fully covered the variables in the study and therefore combined and enhanced the models such as Technology Acceptance Model and theories such as Soft Systems Theory and Task Technology Fit Theory among others discussed in this section to develop a comprehensive framework for the study. Below in Figure 2.1 is the research model that was used in the study.

The following figure is adopted from various sources

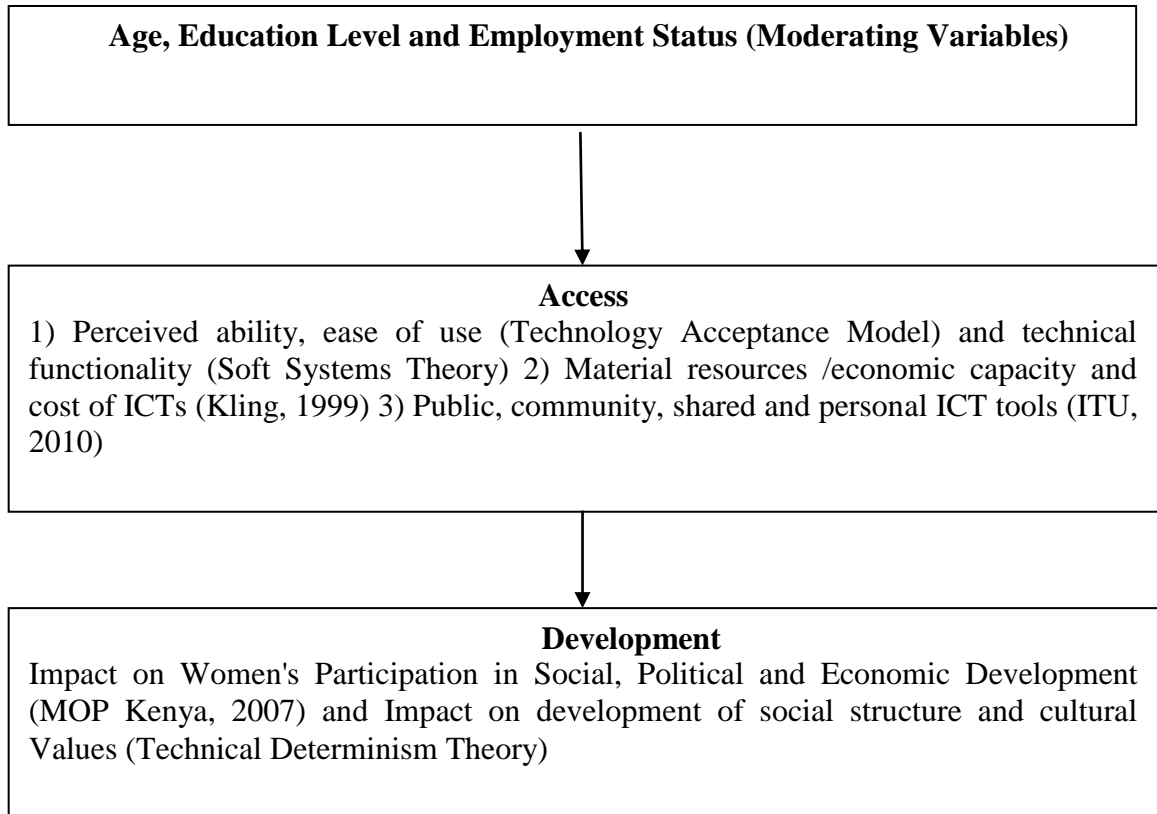


Figure 2.1: Research Model

2.3 Conceptual Framework

In conducting the study, a conceptual framework was used to show the relationship between the independent variables and dependent variables. The independent variables comprise of the three measures of universal access: affordability, availability and accessibility (International Telecommunications Union, 2011).

The moderating variable of personal characteristics including age, employment status and education level. The dependent variable of women's participation in development

comprises of social, economic and political development guided by Vision 2030 three pillars (Ministry of Planning, 2007).

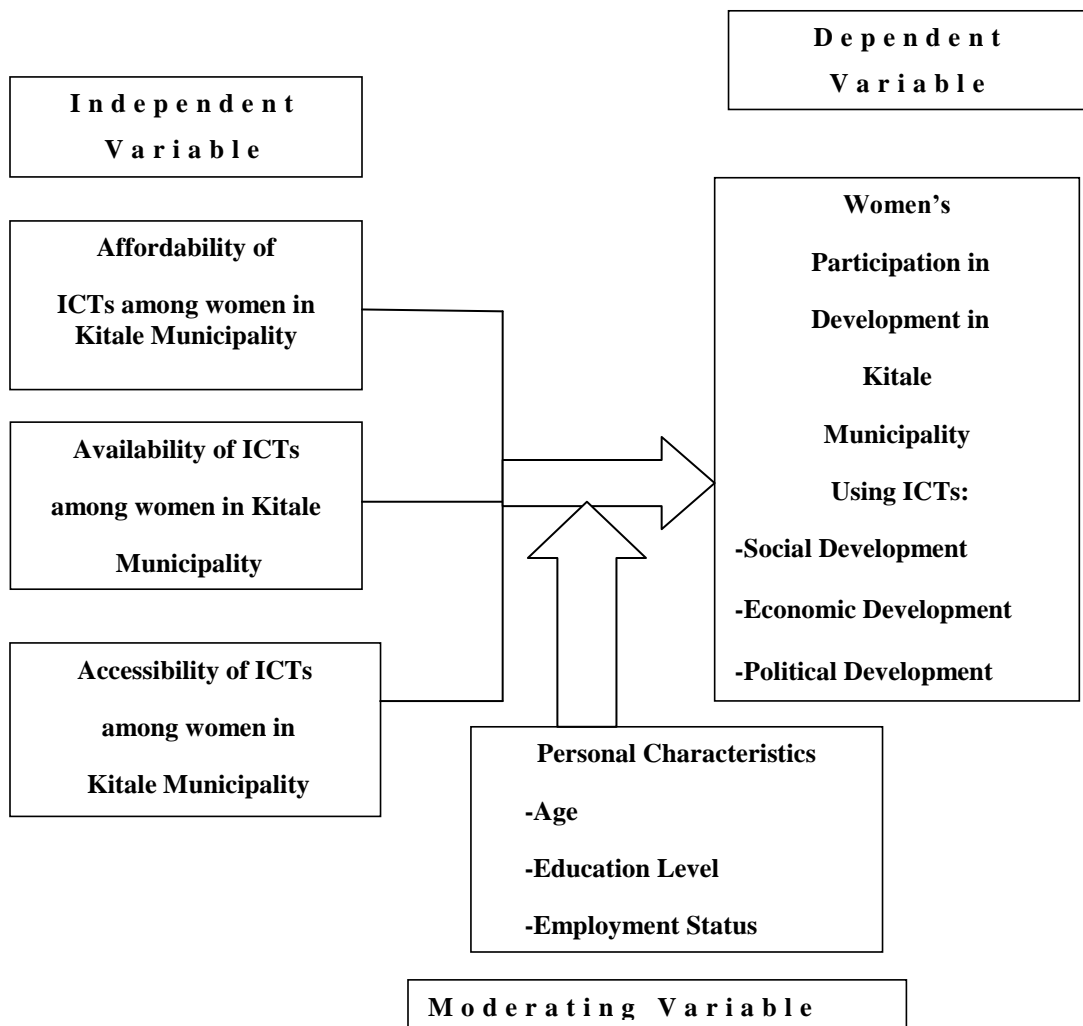


Figure 2.2: Conceptual Framework

2.4 Critique of Literature

There have been a few researches that have similar areas of interest as this study. In a study by Toumi (2016) on effects of age and gender and class on ICT access and usage for political participation however it was done in a coastal town in Tunisia which is very different culturally and in economic activities from the study area in this study. The study

area covered three municipalities while this study covered only one. Yet both studies utilized geographical stratification. The study used snowballing and convenience sampling while this study used random stratified sampling. The study used semi structured interviews while this study used semi structured questionnaires to collect data. The study findings were that only age had a significant effect on ICT usage for political participation, this was also the case in this study. The study was not exclusively targeting female respondents as was this study and therefore is not really comparable especially with a view of the gender digital divide and the rural urban divide since the study took place in a town while this study was conducted in a rural area.

In a study by Neyole (2014) on the effects of access to ICTs particularly mobile money on economic development of small scale farmers who are women in terms of increased income. Both studies targeted an exclusively female population in the same geographical area however the study targeted only small scale farmers while this study was open to all women who met the age limit. The study covered only three large constituencies while this study covered all ten civic wards in Kitale hence the likelihood of much more representative sample being used in this study. The study also limited personal attributes such as education leaving out the pre secondary and post tertiary category. As well as age limit of 72 compared to 65 in this study. Both studies used structured questionnaires to collect data and had similar findings on the significance of education on the income and economic development.

2.5 Summary

The theoretical review explores the wide area of access to ICTs through the three hallmarks of universal access i.e. affordability, availability and accessibility With a focus on the gender digital divide including dimensions and levels of digital divide as well as constraints to different types of access. In the area of affordability the various cost implications, in the area of availability the complex relationships between technology and development while in the area of accessibility how the mere

acquisition of ICT skills is rendered inadequate by the approaches to and modes of ICT adoption taken by women. The underlying drives and needs that affect ICT consumption and the meaning given to ICTs through the purpose they serve. This formed the basis for this study by challenging the researcher to explore not just the simplistic aspect of material access of ICTs but more importantly the functionality ICTs hold for women. Especially the factors that in turn drive development in line with the technological determinism theory. This theoretical framework makes the contribution to the field of ICT policy of bringing to light the complexity of bridging the gender digital divide due to the numerous factors affecting adoption of ICTs especially for women. This framework sheds light for ICT policy makers as to what factors are significant to ICT adoption.

2.6 Research Gaps

There is little critical empirical gender and ICT literature and there has been little systematic collection of sex disaggregated data on ICT access and use and even less that analyses the descriptive data that exists. Without such analysis, descriptive data is not only incomplete but can also mislead policy makers on the correct points of policy intervention aimed at encouraging greater gender equity in ICTs (Research ICT Africa,2014). This lack of empirical research means that there are few examples in the literature upon which researchers can currently model their work. While (Walsham & Sahay, 2005) outlined research on information systems in developing countries and suggested potential areas for future research, a notable omission was the issue of gender and gender relations. This researcher having noted these gaps seeks to evaluate whether greater access to ICTs aids women participate in functions that are important to them, meet their needs and empower them.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This chapter deals with methodology that was used in carrying out the research study. It covers research design, target population, sampling techniques, data collection instruments, data collection procedures and methods of data analysis.

3.2 Research Design

Research design was a study that adapted a descriptive survey research design. The study used both quantitative and qualitative data collection methods to describe the role of access to ICTs in promoting women's participation in economic, social and political development in Kitale Municipality (Kothari, 2006). According to Mugenda and Mugenda (2003) descriptive research was used to obtain information concerning the current status of the phenomena to describe what exists with respect to variables or conditions in a situation. The study considered this design appropriate since it facilitated gathering of reliable and accurate data that clearly described the role of access to ICTs in promoting women's participation in development. According to Kothari (2006) survey design requires the researcher to make a detailed examination of the population to determine its characteristics and it is then inferred that the population has the same characteristics.

3.3 Population

According to Mugenda and Mugenda (2003) target population represents all cases of people, organization or institution which possess certain characteristics of population

involved in the study and a population refers to the entire group or persons or elements that have at least one thing in common. The study area was Kitale Municipality in Trans-Nzoia county. The target population for this study was women of varied age groups, educational background and socio-economic status in Kitale Municipality in Kenya. The age criteria were 18 to 65 because this is the age bracket actively involved in development in Kenya. The minimum age for participation in socio-political development was 18 years of age while age of retirement recognized by the government of Kenya is 65 years and hence this is the age cluster which was actively involved in economic development. The study used the subsectors of the ten civic wards in Kitale Municipality.

3.4 Sampling Frame

The study area of Kitale municipality has ten civic wards as listed by the Independent Interim Election and Boundaries Commission (2015) as seen in the sampling frame illustrated in Table 3.1. The frame was chosen because it captured the diversity of Kitale.

Table 3.1: Sampling Frame

Population Category	Study Population
----------------------------	-------------------------

Hospital	39
Webuye	39
Kibomet	39
Lessos	39
Mumia	39
Tuwani	39
Milimani	39
Sokoni	39
Masaba	39
Kipsongo	39
Total	390

3.5 Sample and Sampling Technique

Chandran (2003) defined sampling as a process of selecting a number of individuals or objects from a population such that the selected group contains elements representative of the characteristics found in the entire group; a selection from the population. Stratified random sampling technique is a technique that identifies sub groups in the population and their proportions and selects from each sub group to form a sample (Sekaran, 2003). The stratification was done based on the 10 civic wards in Kitale Municipality as listed by the Independent Interim Election and Boundaries Commission (2015) namely: Webuye, Kibomet, Lessos, Mumia, Tuwani, Milimani, Sokoni, Masaba, Hospital and Kipsongo. The researcher allocated a quota of 39 respondents per civic ward who were then randomly selected. The various wards represent different socio-economic strata for example Milimani is considered on the high end while Kipsongo is at the lowest end; this was the basis of equal representation for each of the ten wards. The researcher was of the

opinion that this would give a more representative sample than using population ratios and population density to guide the quota the study allocated to each civic ward.

Determination of sample size was done using published tables. Kretjicie and Morgan table (Kretjicie & Morgan, 1970) with a confidence level of 95% and 5% margin of error the sample size was 390. The female population age 18 to 65 years in Kitale Municipality is 37,701 according to the 2009 census (Kenya National Bureau of Statistics, 2009). The table was constructed from the formula:

$$s = X^2 NP (1-P) \div d^2 (N-1) + X^2 P(1-P).$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level

(3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

$$S = 3.841 \times 3.841 (1-.50) / .05 \times .50 (37,701-1) + 3.841 \times 3.841 .50 (1-.50) = 395$$

3.6 Instruments

The survey instrument was divided into six sections, section one captured individual characteristics, items 1-5 captured demographic of respondents. Item 1 captured age, item 2 captured education level, item 3 captured employment status.

Section two captured use of ICTs for women's participation in development in Kitale Municipality. Item 1 addressed use of ICTs for political development in the last 12 months, item 2 addressed use of ICTs for participation in social development in the last 12 months while item 3 addressed use of ICTs for economic development.

Section three addressed affordability of ICTs for women in Kitale Municipality. Item 1 addressed the cost of ICT equipment, item 2 addressed the cost of service, item 3 addressed access to free internet in the last 12 months while item 4 addressed access to cheaper ICT tools and service on offer.

Section four addressed availability of ICTs for women in Kitale Municipality. Item 1 addressed internet availability in the area. Item 2 addressed points of internet access measuring public versus private access in the last 12 months while Item 3 addressed frequency or intensity of the internet.

Section five addressed accessibility of ICT's for women in Kitale Municipality. Item 1 addressed barriers to internet penetration and item 2 addressed ICT skills and efficacy in use of ICTs.

3.7 Data Collection Procedure

The study collected both primary and secondary data, qualitative and quantitative data. According to Kothari (2006), structured questionnaires have closed ended questions where respondents are limited to a fixed number of responses these include yes/no type of questions, multiple choice and scale questions which are graded on a continuum such as the Likert Scale, this method is ideal where number of respondents are high and low level of involvement of the researcher, it is standardized and therefore a reliable method of research. Structured questionnaires (Kothari, 2006) were presented in the same order and wording to all respondents, all questions and answers are specified and comments in the respondent's own words are held to a minimum. They were simple to administer and inexpensive to analyze especially for large sample sizes. The information obtained from

questionnaires was free from bias and researcher's influence and thus accurate and valid data was gathered.

Primary data was gathered using quantitative data collection methods in particular structured questionnaires and after a pre-test and pilot test, the respondents were issued the questionnaires with closed ended questions. There was use of qualitative data collection methods as well particularly KII – Key Informant Interview (Kumar, 1996) to refine data collection efforts, clarify findings of the quantitative research and generate recommendations secondary data was gathered from past published scholarly articles explaining theoretical and empirical information on ICT access studies.

The researcher had allocated 40 questionnaires per civic ward so that if a questionnaire was spoilt, the extra one could be used, however due to the simple and clear guidelines to respondents on how to fill the questionnaire the response rate was 100% and all 390 questionnaires were filled accordingly. To ensure that only women aged 18-65 filled the questionnaire the respondents were asked to show the national identity card to verify their age and no questionnaire was administered to any woman without a national identification card.

3.8 Pilot Test

The questionnaire was shown to colleagues in the industry and statisticians to evaluate validity, reliability, appropriateness and to establish whether the questionnaire was necessary and sufficient. The questionnaire was administered to twenty women in Kitale Municipality, the twenty were two women one from the highest age bracket and one from the lowest in each of the ten civic wards, this was done with a view of obtaining a representative pilot test, the questionnaire on average took twenty minutes to complete. Upon completing the questionnaire, the group and the researcher analyzed the information provided to clarify directions, question wording and response categories. The questionnaire was revised accordingly.

3.9 Data Processing and Analysis

Quantitative and qualitative data analysis method was used. Quantitative data provides hard evidence for a theory that can be proved and tested. According to Kumar(1996) quantitative data derived from the instruments was analyzed using descriptive statistical method which is appropriate as they show the distribution against each of the variable under investigation, whereby raw data from questionnaires was checked for completeness, errors, and coded for analysis and presented using visual techniques in tables which is the most simple, straight forward way of presenting numbers and percentages for cross comparisons and analysis, graphs to show to show patterns ,relationships and identify trends visually, pie charts, diagrams also presentation through figures and essay appropriately. Databases were designed to check errors during data entry by accepting only options offered in the questionnaire.

Descriptive statistical analysis was done by cross tabulations because of the need to analyze the relationship between two or more variables and compare results of one variable with the results of another. Further inferential statistical analysis was done using correlation using the chi test, which is a measure of the strength of the linear relationship between two variables, to describe the strength of the association between the variables. There was also a sensitivity analysis to identify the variables with the greatest effects on the outcome. The study tested the significance of the independent variables through multiple linear regression. The ratings provided for each variable was used as control variables.

The statistical model was $y=b_0+b_1x_1+b_2x_2+b_3x_3$ where:

y = women's participation in development

x1 = affordability

x2 =was availability

x3 =was accessibility

Ethical considerations for the study included ensuring that no psychological, social and financial harm comes to those who participated in the study this was done by obtaining informed consent from all participants, with the assurance of results remaining anonymous to protect their privacy. The researcher also maintained objectivity and represent results accurately.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The purpose of this study was to examine the effects of access to ICTs on women's participation in development in Kitale Municipality in Kenya. It further determined the effects of affordability, availability and accessibility of ICTs and personal characteristics on women's use of ICTs for participation in political, social and economic development. This chapter presents the research findings and the discussion of the findings. First, the results relating to the general characteristics of the respondents are provided. The findings are presented in relation to the study objectives. The findings are presented through both descriptive and inferential statistics. The analysis is divided in two sections; one is purely descriptive analysis of the selected variables, while the second is inferential based on the conceptual model developed in the study. Further the discussion of the findings is presented. The study is based on the responses from 390 respondents who participated in the study. The distribution of these 390 respondents is as indicated in Table 4.1.

Table 4.1: Distribution of Respondents by Location

Location	Frequency	Percent	Cum Percent
Kipsongo	39	10.0	10.0
Sokoni	40	10.3	20.3
Tumani	39	10.0	30.3
Kibomet	39	10.0	40.3
Hospital	39	10.0	50.3
Milimani	38	9.7	60.0
Webuye	39	10.0	70.0
Lessos	39	10.0	80.0
Masaba	39	10.0	90.0

4.2 Personal Characteristics of the Respondents

4.2.1 Age of the Respondents

Figure 4.1 shows the respondents' distribution by age. The results indicated that majority 42.3% (165) of the respondents were between the ages of 18-25 years, whereas 27.7% (108) were aged between 35-45 years. Ninety-three (93) respondents representing 23.8% of the study sample were between the ages of 25-35 years. Those between the ages of 45 and 55 formed 4.6% (18) and the least interviewed were between the ages of 55-65 years at 1.6% (6) of the total. This implies that the youngest age group is very high thus the likelihood of the results being skewed towards that age group.

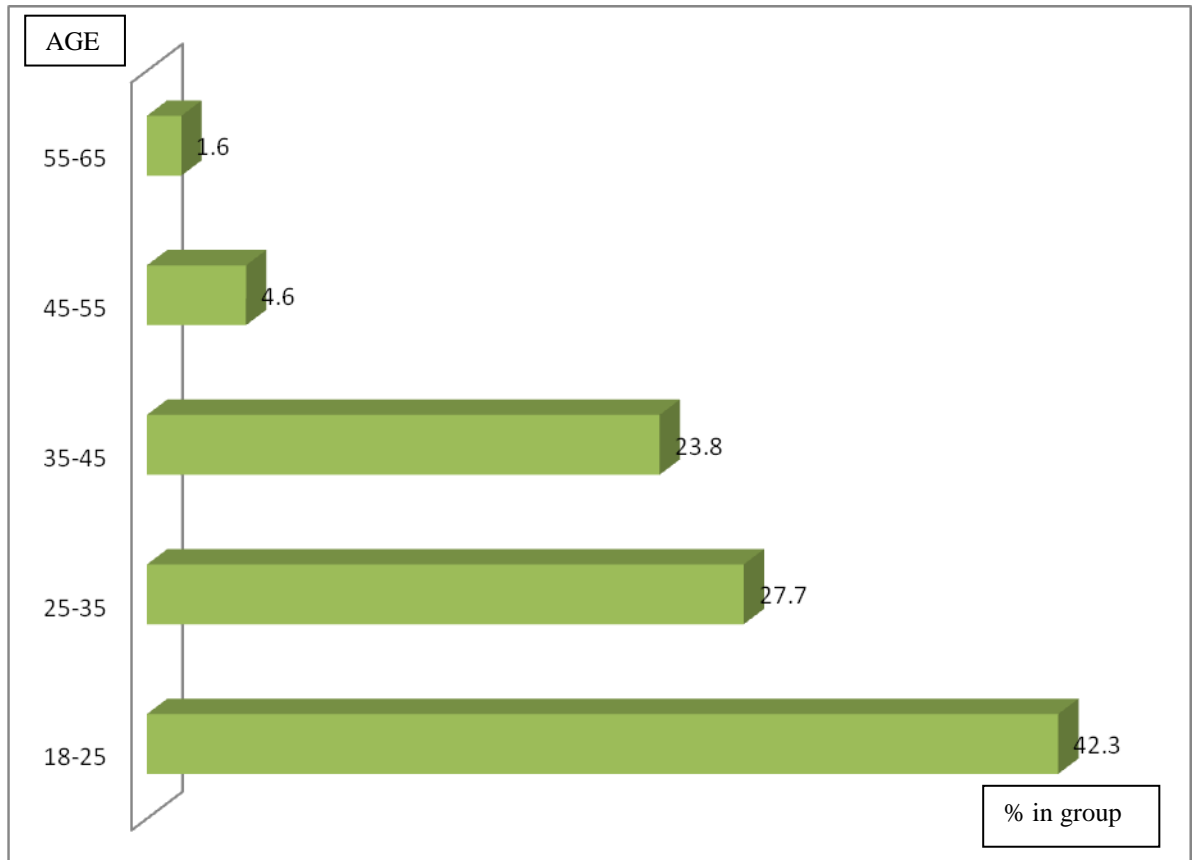


Figure 4.1: Age of Respondents

4.2.2 Education Level of Respondents

The study also sought to establish the education level of respondents. Results are presented in Table 4.2. The results indicated that the highest was 44% (172) of the respondents had upper secondary/post-secondary/non-tertiary education. Those with post tertiary education (post graduate diploma/masters/PhD) were 2% (8). This implies that majority of the respondents at the middle level on the education ladder and had the capacity to be engaged in development.

Table 4.2: Education level of respondents

Education Level	Frequency	Percent
Primary/Lower	70	18
Lower secondary	117	30
Uppersecondary/Post-secondary/Non-tertiary	172	44
Tertiary level	23	6
Post-tertiary(Postgrad Dip/MSc or PhD)	8	2
Total	390	100

4.2.3 Employment Status

Figure 4.2 shows the employment status of the respondents. Majority 167 (42.8%) stated that they were self-employed, followed by 126 (32.3%) who were employed. The rest (24.9%) were classified as others which included students, housewives, the unemployed and retirees. Those employed used ICTs to participate more in spite of the self-employed being the majority perhaps due to the time and financial demands of self-employment.

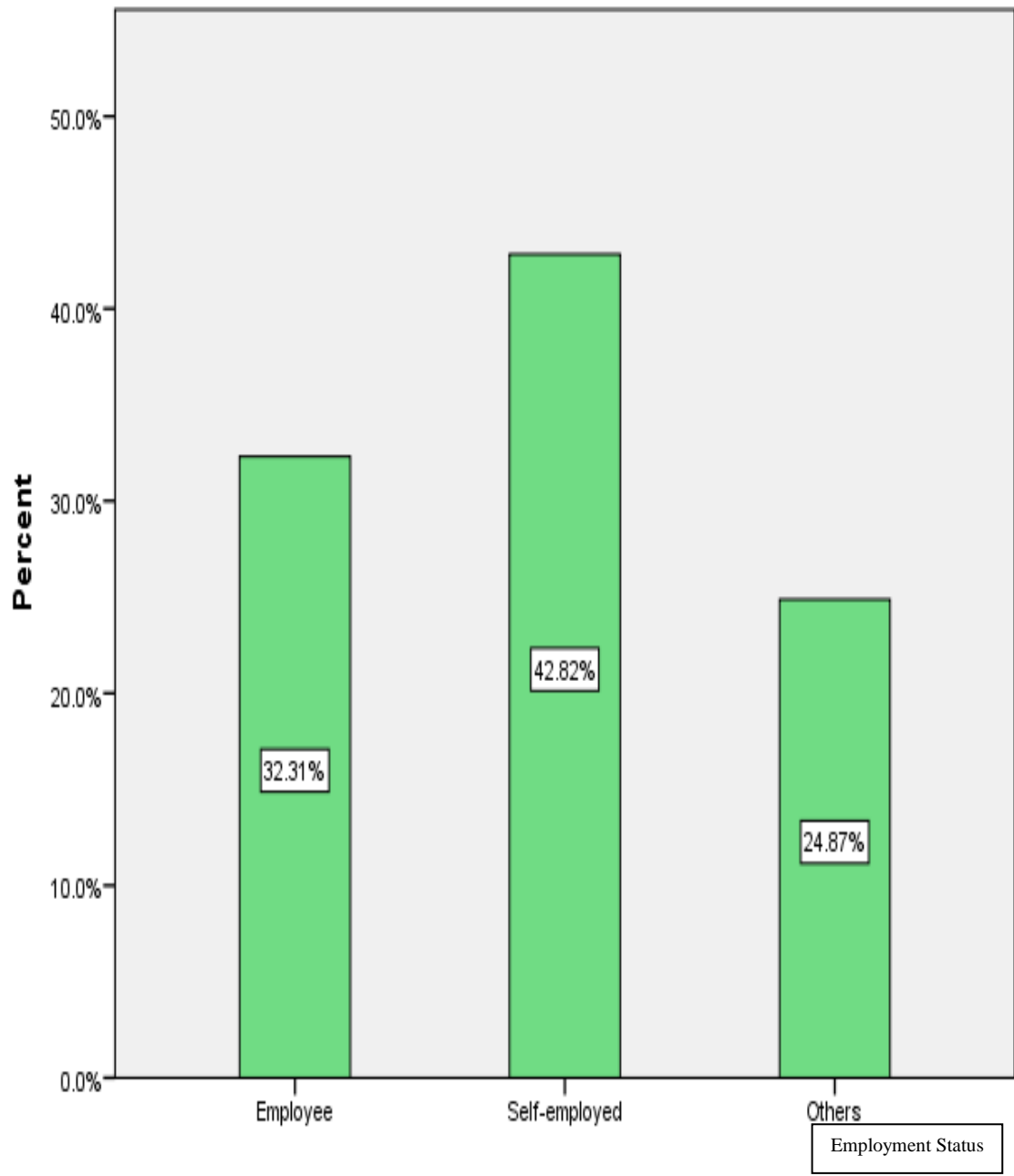


Figure 4.2: Employment Status

4.3 Personal Characteristics and Use of ICT for Development

Personal characteristics included education level ranging from lower primary to post tertiary and employment status ranging from employees to self-employed women to housewives, student and retirees among others in the third category of others.

4.3.1 Personal Characteristics and Use of ICT for Political Development

Table 4.3 presents results pertaining to personal characteristics and use of ICTs for development. In regards to employment status and usage of ICT for participation in political development. The results indicated that 85% of those who were employed participated in political development using ICT to an extent of 11% while 77% of the self-employed and 84% of those categorized as others had participation in political development of 11%. Murdock *et al.* (1996) observations coincide to the findings of this study as illustrated on the table below, that, material resources and economic capacity play a central role in determining (i) whether women use ICTs and then (ii) the nature and subsequent patterns of that use. The economics of gaining access are, therefore, an obvious prohibitive factor to women using ICT as seen in the self-employed who were the majority but had lower participation levels in spite of having the numbers.

Table 4.3: Cross tabulation of Personal Characteristics and Use of ICT for Political Development

To what extent (%) were ICTs used in the last 12 months for Participation for in Political Development?						
Employment Status	11%	22%	33%	44%	55%	Total
Employee	85%	2%	3%	8%	2%	100%
Self-employed	77%	0%	23%	0%	0%	100%
Others	84%	8%	0%	8%	0%	100%
Total	84%	2%	7%	6%	1%	100%

To what extent (%) were ICTs used in the last 12 months for Participation for in Political Development?						
Education Level	11%	22%	33%	44%	55%	Total
Lower secondary	100%	0%	0%	0%	0%	100 %
Upper Secondary/Post-Secondary/Non-tertiary	94%	1.20%	1.20%	3.60%	0%	100 %
Tertiary level	33.30%	11.10%	44.40%	11.10%	0%	100 %
Post-tertiary(Postgrad Dip/MSc or PhD)	0%	0%	66.70%	0%	33.30%	100 %
Total	83.70%	2%	7.10%	6.10%	1%	100 %

N=390

As Kling (1999) observed, the total costs of ownership of technologies such as computers has been shown to be a fraction of initial equipment costs - with training, upgrading and reconfiguration proving to be the major costs over time. Findings from this study have

established an association between employment status and computer use as is further shown below. These findings indicated that those who were employed were more inclined to using computers than those who were self-employed or those who were categorized as others. The study showed that respondents who were employed had more disposable income and spent more on ICTs. The findings of this study further indicated that those who were employed had more access to the internet than their self-employed counterparts or those categorizes as others. The employed were also had the highest use of ICTs for participation in political, social and economic development as shown above. The study also sought to establish whether education level of the respondents was related to use of ICT for political development. A cross tabulation of education against use of ICT in political development was conducted with results as indicated in Table 4.3 The results indicated that all respondents with lower secondary education had used ICT for political development to an extent of 44%. Moreover, 94% of respondents with upper secondary education had used ICT for political development to an extent of 11%. Further results indicated that 66.7% of the respondents with post tertiary education had used ICT for political development to an extent of 33%. This indicates that those with higher education level also had higher levels of participation in development.

Psychologists weighing in on this discourse point towards a range of cognitive and affective factors as important in determining women's' engagement with technology - such as perceived ease of use, self-efficacy, perceived behavioral control and perceived ability (Zhang, 2008). The findings of the study showed that education levels indicative of cognitive abilities of respondents contribute to women's use of ICTs for participation in development in Kitale Municipality. Chi square results presented in Table 4.4 and 4.5concur with the observations made above the table indicated that there was significant association between employment status and participation in political development using ICT ($\chi^2 = 14.779$; $p > 0.05$).

Table 4.4: Association between Employment and Participation in Political Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.779	8	0.064
Likelihood Ratio	14.56	8	0.068
Linear-by-Linear	0.008	1	0.927
Association			
N of Valid Cases	98		

Significance Level = 0.05

Test of whether education level was associated with use of ICT for political development was conducted. The results (Table 4.5) indicated that there was a significant association between education level of respondents and their usage of ICT for political development ($\chi^2 = 110.638$; $p < 0.05$).

Table 4.5: Association between Education and ICT use for Political Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	110.638	12	0.000
Likelihood Ratio	51.335	12	0.000
Linear-by-Linear Association	15.379	1	0.000
N of Valid cases	98		

Significance Level = 0.05

4.3.2 Personal Characteristics and Use of ICT for Social Development

Further, cross tabulation of employment status against participation in social development was conducted. Results in table 4.6 below indicate that 49.1% of those who were employed, 82% of the self-employed and 83.5% of those categorized as others barely used ICTs for participation in social development in the preceding 12 months.

Table 4.6: Cross tabulation of Personal Characteristics and Use of ICT for Social Development

To what extent (%) were ICTs used in the last 12 months for						
Employment	0-9%	10-27%	28-45%	46-63%	64-100%	Total
Employee	49.10%	44.50%	5.60%	0%	0.80%	100%
Self-employed	82.00%	12.60%	4.20%	0.60%	0.60%	100%
Others	83.50%	12.40%	3.10%	1%	0%	100%
Total	71.80%	22.90%	4.10%	0.60%	0.60%	100%

To what extent (%) were ICTs used in the last 12 months for						
Education Level	0-9%	10-27%	28-45%	46-63%	64-100%	Total
Primary/Lower	100%	0%	0%	0%	0%	100%
Lower Secondary	96.40%	1.80%	1.80%	0%	1.80%	100%
Upper Secondary/Post-Secondary/Non Tertiary	44.90%	50.30%	4.80%	0%	4.80%	100%
Tertiary level	54.50%	9.00%	27.30%	4.50%	31.80%	100%
Post Tertiary (PostGrad Dip/MSc or PhD)	33.40%	16.70%	16.70%	16.70%	33.40%	100%
Total	70.40	24.00%	4.50%	0.60%	5.10%	100%

N=390

The results of Table 4.6 above indicate that 100% of primary or lower level respondents had barely used ICT for social development for the 12 months prior to the study. However, only 33.4% of those who had attained post tertiary level of education had barely used ICT for social development for the twelve-month period. Higher education levels increases levels of participation.

Test of association between employment status and use for ICT for social development was conducted using chi square test. The results presented in Table 4.7 below indicated that there was a significant association between employment status and participation in social development using ICT ($\chi^2 = 66.497$; $p < 0.05$). The results indicated that those who were employed were more inclined to participate in social development using ICT.

Table 4.7: Association between Employment and Participation in Social Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	66.497 ^a	18	0.000
Likelihood Ratio	64.304	18	0.000
Linear-by-Linear	16.177	1	0.000
Association			
N of Valid Cases	318		

Significance Level = 0.05

Table 4.8 indicates that there was a significant association between education and use of ICT for social development ($\chi^2 = 320.816$; $p < 0.05$). Those who had attained higher levels of education used ICT more for social development.

Table 4.8: Association between Education and Use of ICT for Social Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	320.816	36	0.000
Likelihood Ratio	208.713	36	0.000
Linear-by-Linear Association	96.935	1	0.000
N of Valid Cases	371		

Significance Level = 0.05

Table 4.9: Cross Tabulation between Personal Characteristics and Participation in Economic Development Months for

	for Participation for Economic Development?				
Employment Status	0-9%	10-27%	28-45%	46-54%	Total
Employee	90.40%	4%	4.80%	0.80%	100%
Self Employed	87.40%	6%	3.60%	3%	100%
Others	94.90%	3.10%	2%	0%	100%
Total	90.20%	2.30%	3.60%	1.50%	100%

4.3.2 Personal Characteristics and Use of ICT for Economic Development

EducationLevel					
Primary/Lower	100%	0%	0%	0%	100%
Lower secondary	94.70%	3.60%	1.80%	0%	100%
Uppersecondary/Post-secondary/Non-tertiary	89.20%	4.80%	5.40%	0.60%	100%
Tertiary level	54.50%	27.20%	9.10%	9.10%	100%
Post-tertiary(Post grad Dip/MSc or PhD)	33.30%	0%	16.70%	50%	100%
Total	89.70%	4.80%	3.80%	1.60%	100%

N=390

Lastly a cross tabulation between employment status and participation in economic development was conducted. Results in Table 4.9 indicate that 90.4% of those who were employed had barely participated in economic development using ICT compared to 87.4% of those who were self-employed and 94.9% of those that were categorized as others. These findings indicated that those who were employed had participated more in

economic development using ICT. A test was also conducted to establish whether employment status was associated with participation in economic development using ICT. The results also indicate that all respondents (100%) who had primary level of education had barely used ICT for economic development for a period of 12 months prior to the study. For those who had attained post tertiary education, 50% had used ICT for economic development to an extent of 46 -54%. This shows a positive correlation between education levels and levels of participation in development.

Chi square results in Table 4.10 indicated that there was a significant association between employment status and participation in economic development using ICT ($\chi^2 = 60.038$; $p < 0.05$).

Table 4.10: Association between Employment and use of ICTs for Economic Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	60.038	12	0.000
Likelihood Ratio	60.862	12	0.000
Linear-by-Linear Association	10.304	1	0.001
N of Valid Cases	389		

Significance Level = 0.05

Table 4.11 indicates that there was a significant association between services costs and use of ICT for economic development ($\chi^2 = 265.13$; $p < 0.05$). Those who had attained higher levels of education used ICT more for economic development.

Table 4.11: Association between Education and Use of ICT for Economic Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	265.13	24	0.000
Likelihood Ratio	196.247	24	0.000
Linear-by-Linear	75.388	1	0.000
Association			
N of Valid Cases	370		

Significance Level = 0.05

4.4 Use of ICTs for Women Participation in Development

This section findings was on the various activities the study used to measure levels of participation in political, social and economic development.

4.4.1 Political Development

Table 4.12 below shows the respondents responses to questions related to use of ICTs for participation in political development. The study enquired from the respondents whether in the 12 months prior to the study they had used ICTs to participate in the various political development activities. The greater the number of activities done the higher the level of participation. The study established that 62 (15.90%) of the respondents indicated that they had used ICT tools to learn about the constitution and their constitutional rights while 37 (9.49%) had used ICT tools to access political information and for civic education. Further results indicated that only 12 (3.08%) of the respondents indicated that they used ICT tools to follow parliamentary proceedings, debates and current affairs. Additionally, 11 (2.82%) of the respondents had used ICT tools to browse government websites, access government services such as police P3 form and enquire on information disseminated by government. These findings indicated that usage of ICTs in Kitale municipality for women’s participation in political development was low.

Table 4.12: Access to ICT for Participation in Political Development

Which political activities of the below listed have you used ICTs to do in the last 12 months?	Freq	Per cent
Learn about the constitution and your constitutional rights	62	15.9
Access political information and civic education	37	9.49
To follow parliamentary proceedings, debates and current affairs	12	3.08
To browse government websites, access government services such as police P3 form and enquire on information disseminated by government	11	2.82
To participate in political debates, access your representative interact with constituents and contribute to political discussions	6	1.54
To register online for political activities	4	1.03
Get information on political events, parties and candidates, election dates and results	3	0.77
Check your voter registration details, polling station and status	2	0.51
To campaign for or finance a political party or candidate	1	0.26
Total	138	35.4

N=390

4.4.2 Social Development

Table 4.13 shows the responses to the access to ICT tools for social development. The tasks pertain use of ICT s for social development. With the number of activities done indicating level of social participation.81% of the respondents used ICTs for participation in social development. Majority 54 (13.85%) of the respondents indicated that they had used ICT tools to access religious, inspirational, entertaining and recreational materials such as music videos. This was closely followed by 53 (13.59%) who used ICT tools for socializing, dating and increased contact with family and friends through social media, Skype, email, online chat or SMS. Others had used ICT tools to increase contact with those who shared similar religious beliefs and political views 45 (11.54%). Further results indicated that ICT tools were used to access social support, encouragement and mentorship 43 (11.03%), access to learning, computer based training and up to date

information 38(9.74%) and to increase contact with business associates, customers, students, teachers 33(8.46%) among others.

Table 4.13: Access to ICTs for Participation in Social Development

Which Social Activities of the below listed have you used ICTs to do in the last 12 months?	Responses	Percent
Access religious, inspirational, entertaining and recreational materials such as music videos	54	13.85%
For socializing, dating and increased contact with family & friends via social media, Skype, email, online chat or SMS	53	13.59%
Increase contact with those who share similar religious beliefs, political views	45	11.54%
To access social support, encouragement and mentorship	43	11.03%
Access to learning, computer based training and up to date information	38	9.74%
Increase contact with business associates, customers, students, teachers	33	8.46%
To download government forms such as P3,police abstract, KRA tax returns forms, PIN application	14	3.59%
Increase contact with those who share similar hobbies and interests, blogging	11	2.82%
To access e-library services and online publications, online newspapers and magazines	9	2.31%
Online appointment booking or license or certificate application e.g. marriage, death and birth certificate	8	2.05%
To seek health information on injury, disease and nutrition	7	80.77%

N=390

he technological determinism theory (Bradley, 2005) posits that a society's technology drives the development of its social structure and cultural values implying that technology is the key mover and determinant in history and social change. It emphasizes the impact of technology on these facets of a society and the capacity of technology to frog leap a society to other stages of socio-political and economic growth. The findings of the study confirmed this theory, use of ICTs that have shaped the social change such as social media or those that shape economic transactions such as money transfer and virtual banking have been revolutionary and the findings of the study confirmed that these ICT applications have enabled higher participation for women in development.

4.4.3 Economic Development

Table 4.14 shows responses on the question on respondents' use of ICT tools for economic development. 55% of the respondents used ICTs for participation in economic development. Majority 81(20.77%) of the respondents used ICT tools to make savings, send or receive money or get information on how to use the services while 38(9.74%) used ICT to advertise, search for, get information on buying or selling of goods and services. The respondents who used ICT tools to find out about/ apply for get loans (e.g. Mshwari) or pay back loans were 35(8.97%).

Table 4.14: Access to ICTs for Participation in Economic Development

Which economic activities of the below listed have you used ICTs to do in the last 12 months?	Responses	Percent
Find out about/ apply for/get loans(e.g. Mshwari) /payback loans	35	8.97%
Make savings, send or receive money or get information on how to do it	81	20.77%
To buy or sell goods and services	22	5.64%
Advertise ,search for ,get information on goods and services	16	4.10%
Which economic activities of the below listed have you used ICTs to do in the last 12 months?	Responses	Percent
Online financial management such as to pay via money transfer for online utilities e.g. water, electricity, amenities, security ,bus tickets and fees	15	3.85%
To get information on funding, economic and job opportunities	12	3.08%
Use internet or mobile banking get information on and transact on bank accounts or shares	9	2.31%
Looking for a job /submitting job applications	9	2.31%
To support business operations e.g. to send letters and plan work	6	1.54%
Participating in professional networks like LinkedIn and Xing	5	1.28%
ICTS have offered you economic opportunities	3	0.77%
Total	213	54.62

N= 390

4.5 Effects of Affordability of ICTs on Women’s Participation in Development

The table 4.15 below shows the key parameters used to measure affordability being cost of ICT equipment and service as well as availability of Wi-Fi and subsidized ICT tools.

Majority of the respondents found the cost too high and were not able to access Wi-Fi or subsidized and cheaper ICTs.

Table 4.15: Affordability of ICTs

Statement	Disagree	Undecided	Agree	Total	N=3 90
Is the cost of the equipment i.e. mobile	1.2	1.1	97.7	100	4.5. 1 Aff ord
Is the cost of the service i.e. airtime and	0.7	2.3	97	100	
Is Free Internet Access Available	37.7	61.2	1.1	100	
Access to cheaper ICT Tools	22.6	75.8	1.6	100	

ability and Use of ICTs for Political Development

The study sought to establish the association between affordability of ICT tools and use of ICT tools for political development. The results presented in Table 4.16 indicated that 85.7% of those who agreed that cost of ICT equipment was too high used ICT for political development at 11% extent. Further results indicated that 33.3% of those who strongly agreed that cost of ICT equipment was very high used ICT for political development at the extent of 11%, 22% and 33%. It also indicates that 18 indicate that all the respondents (100%) who disagreed that service costs are high used ICT in political development to the extent of 11%. For those who agreed that service cost was too high, 90% used ICT for political development at the extent of 11%. The use of ICTs for participation was low across the board with no regard to affordability of this tools.

Table 4.16: Cross tabulation of Affordability and Use of ICT for Political Development

Cost of ICT equipment is too high	The extent of use of ICTs for participation in Political Development in the last 12 months?					Total
	11%	22%	33%	44%	55%	
Agree	85.70%	1.10%	6.60%	5.50%	1.10%	100%
Agree Strongly	33.30%	33.30%	33.40%	0%	0%	100%
Total	84.00%	2.10%	7.40%	5.30%	1.20%	100%

Cost of service too high?	The extent of use of ICTs for participation in Political Development in the last 12 months?					Total
	11%	22%	33%	44%	55%	
Disagree	100%	0%	0%	0%	0%	100%
Undecided	50%	50%	0%	0%	0%	100%
Agree	90%	1.40%	5.70%	1.40%	1.40%	100%
Strongly	71.40%	0%	9.50%	19%	0%	100%
Total	85.10%	2.10%	6.40%	5.30%	1.10%	100%

N=390

The test of association between cost of equipment and use of ICT for political development was conducted. The results are presented in Table 4.17. The results indicated that there were significant associations between cost of equipment and use of ICT for political development ($\chi^2 = 18.118$; $p < 0.05$). Those who agree strongly have the higher level alluding to their stronger inclination towards use of ICTs.

Table 4.17: Association between cost of ICT Equipment and use of ICT for Political Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.118	4	0.001
Likelihood Ratio	7.331	4	0.119
Linear-by-Linear Association	1.456	1	0.228
N of valid cases	390		

Significance Level=0.05

The study further determined the relationship between service costs and use of ICT for political development. The results presented in Table 4.18 the test of the relationship between service costs and use of ICT in political development was performed. The results indicate that there was a significant relationship between services costs and use of ICT in political development ($\chi^2 = 33.646$; $p < 0.05$). The respondents who indicated that service costs were too high were ones who were more inclined to use ICT for political development than those who were not.

Table 4.18: Association between Service Costs and Use of ICT for Political Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.646	12	0.001
Likelihood Ratio	15.445	12	0.218
Linear-by-Linear Association	4.205	1	0.004

Significance Level=0.05

4.5.2 Affordability and Use of ICT Tools for Social Development.

The study further established the association between affordability and usage of ICT tools for social development. The results presented in Table 4.19 indicated that 86.5% of the respondents who agreed strongly that ICT equipment costs were too high barely used ICT tools for social development. All (100%) the respondents who strongly disagreed that service costs were too high barely ICT for social development. Moreover, results indicated that 74% of those who agreed that service costs were too high barely used ICT for social development. ICTs were unaffordable across the board.

Table 4.19: Cross tabulation of Cost of ICT equipment and Use of ICT

Extent of Use of ICTs for Participation in Social Development						
Is the Cost of	0-9%	10-27%	28-45%	46-63%	64-100%	Total
Service too high						
Undecided	100%					
Agree	69.40%	25.90%	4.10%	0.30%	0.30%	100%
Agree Strongly	86.50%	3.80%	5.70%	1.90%	2.10%	100%
Total	72.10%	22.50%	4.30%	0.50%	0.60%	100%
Cost of service too high?	11%	22%	33%	44%	55%	Total
Strongly disagree	100%	0%	0%	0%	0%	100%
Disagree	66.70%	33.30%	0%	0%	0%	100%
Undecided	66.70%	16.70%	0%	0%	16.60%	100%
Agree	74%	22.10%	3.30%	0%	0.60%	100%
Strongly Agree	57.70%	29.90%	0.60%	10.50%	2.30%	100%
Total	71.70%	23.30%	3.40%	0%	1.60%	100%

N=390

The association between cost of equipment and use of ICT tools for social development was sought. Chi square test was conducted and the results are as presented in Table 4.20. The results indicated that there was an association between ICT equipment costs and use of ICT in social development ($\chi^2 = 30.459$; $p < 0.05$). Those who were undecided about the costs had the highest level of participation.

Table 4.20: Association between Cost of ICT Equipment and Use of ICT

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.459	18	0.033
Likelihood Ratio	37.678	18	0.004
Linear-by-Linear Association	0.015	1	0.901
N of valid cases	390		

Significance Level=0.05

Test of association between service costs and use of ICT for social development was conducted using chi square. The results presented in Table 4.21 indicated that there was significant association between service costs and use of ICT for economic development ($\chi^2 = 80.059$; $p < 0.05$). Those undecided about if the ICT costs were high had the highest participation and thus indicates their coming to terms on ICT cost implications through increased use of ICTs for participation in social development.

Table 4.21: Association between Service Costs and Use of ICT

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	80.059	32	0.000
Likelihood Ratio	25.23	32	0.797

Linear-by-Linear	1.635	1	0.201
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Association

Significance Level=0.05

4.5.3 Affordability and Use of ICT Tools for Participation in Economic Development.

Lastly, the study sought to establish how cost of affordability affected use of ICT for economic development. The results as presented in Table 4.22 indicated that 100% of the respondents that were undecided on the cost of ICT equipment barely used ICT tools in economic development. Further, 78.8% of those that strongly agreed that cost of equipment was too high also barely used ICT tool for economic development. These findings indicated that most of the respondents who never used ICT for economic development either agreed or strongly agreed that the cost of ICT equipment was too high. This was similar to all (100%) of those who disagreed that services costs were too high had barely ICT for economic development for the twelve months prior to the study. Further, 85.8% of those who strongly agreed that service costs were too high also had not used ICT for economic development for the twelve-month period.

Table 4.22: Cross tabulation of Affordability and Use of ICT for Participation in Economic Development

		Level of Participation in Economic Development in the last 12 months				
Is the Cost of ICT Equipment too high?						
	0-9%	10-27%	28-45%	46-54%	Total	
Undecided	100%	0%	0%	0%	100%	
Agree	92.10%	2.80%	3.40%	1.60%	100%	
Agree Strongly	78.80%	15.30%	3.80%	1.90%	100%	
Total	90.30%	4.50%	3.40%	1.60%	100%	

		Level of Participation in Economic Development in the last 12 months				
Is the Cost of ICT Equipment too high?						
	0-9%	10-27%	28-45%	46-54%	Total	
Strongly Disagree	100%	0%	0%	0%	100%	
Disagree	100%	0%	0%	0%	100%	
Undecided	83.40%	16.60%	0%	0%	100%	
Agree	91.20%	4.50%	3.30%	1%	100%	
Strongly Agree	85.80%	3.60%	7.10%	3.50%	100%	
Total	90.30%	2.50%	4.90%	2.30%	100%	

N=390

The results in Table 4.23 below indicated that there was a significant association between cost of ICT equipment and use of ICT equipment for economic development ($\chi^2 =$

36.893; $p < 0.05$). Those respondents who agreed or strongly agreed that the cost was too high did not use any ICT tool for economic development. There was no difference in use of ICTs for participation in the two directly opposite responders on affordability. The levels fluctuated across the board alluding to no significant effect for participation for the two affordability measure of service costs and ICT costs

Table 4.23 Association between Cost of ICT Equipment and Use of ICT for Participation in Economic Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.893	12	0.000
Likelihood Ratio	34.298	12	0.001
Linear-by-Linear	0.972	1	0.324
Association			
N of valid cases	373		

Significance Level=0.05

Table 4.24 indicated that there was no significant association between service costs and use of ICT for economic development ($\chi^2 = 12.806$; $p > 0.05$). Service costs did not affect participation in any way.

Table 4.24: Association between Service Costs and Use of ICT for Participation in Economic Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.806	24	0.969
Likelihood Ratio	9.839	24	0.995
Linear-by-Linear Association	3.537	1	0.06
N of Valid Cases	373		

Significance Level=0.05

4.6 Effects of Availability of ICTs on Women's Participation in Development

The availability of ICTs was measured by availability of the internet public, community, shared or personal devices

4.6.1 Availability of Internet Services

Figure 4.3 shows the proportion of respondents who had internet services available in the study area. Only about one in three (28%) of the respondents had internet services available to them.

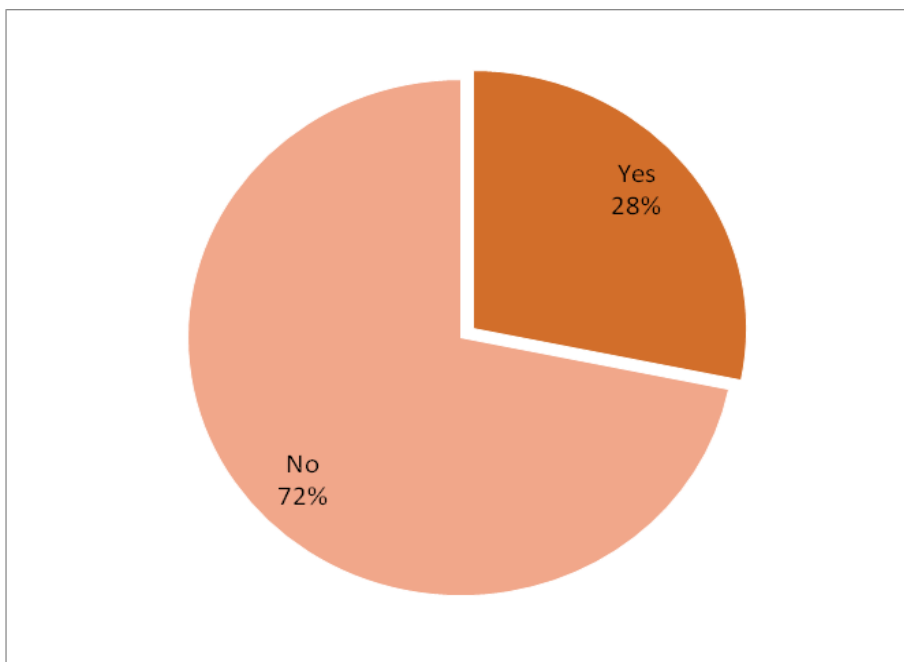


Figure 4.3: Availability of Internet Services in the Area

4.6.2 Availability of private and public internet access points

As mentioned above, availability of internet services in the study area was 28%. Out of this, the results further showed that in the last 12 months about 58% of the respondents had accessed internet services in the privacy of their own home. Those who had accessed internet at work were 24.3%, others are as follows; Commercial internet access facility, 10.1%; Educational institutions 9.2%; 7.5% use mobile phones while 2.8% use mobile devices such as laptops, tablets. This showed that respondents had higher private access

available to them than public access to internet services. This is a positive step to move from universal access mainly focused on public access such as community tele centers to universal service which is ICT services at an individual level, in the workplace, home and mobile devices (ITU,2011).

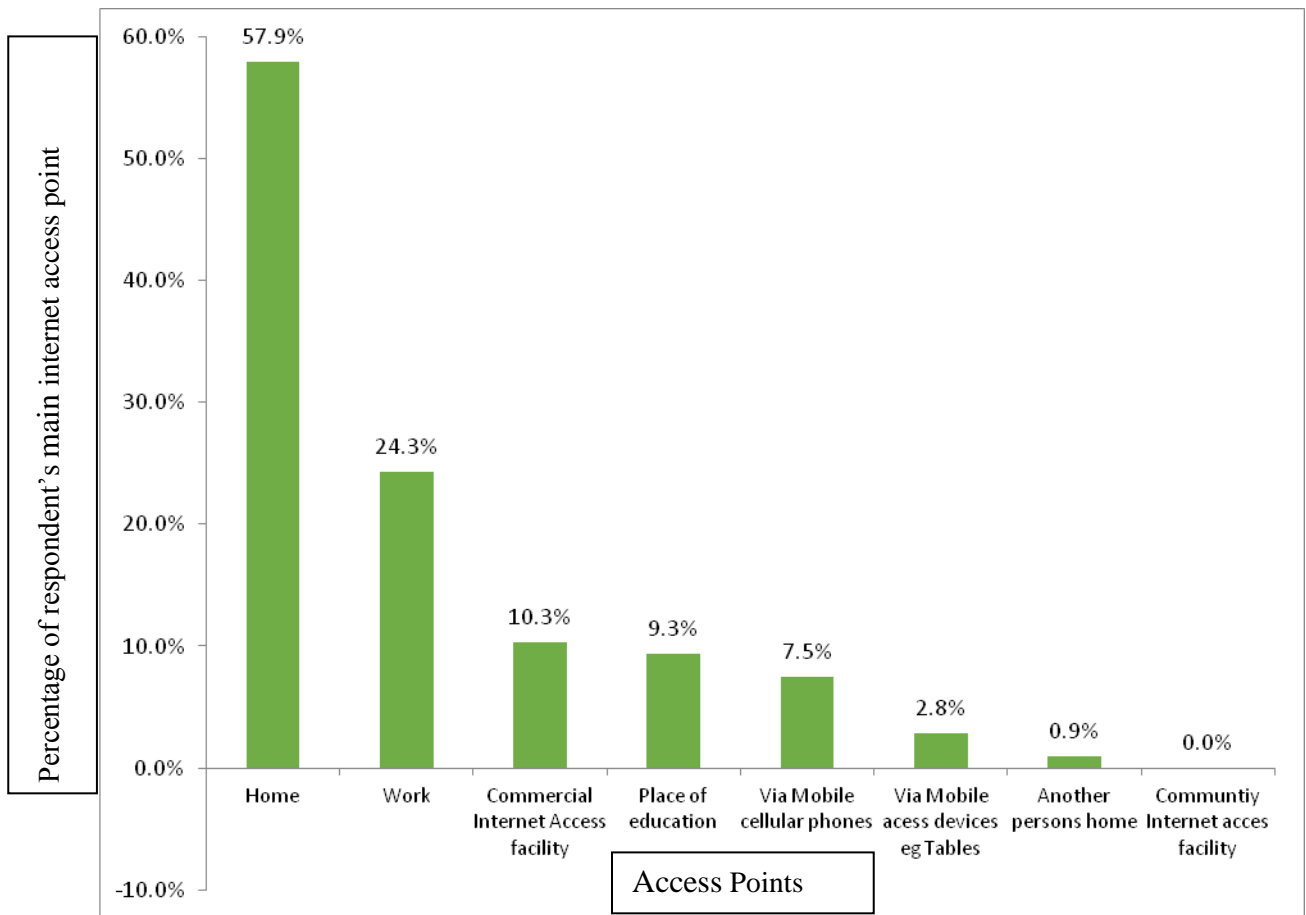


Figure 4.4: Availability of private and public internet access points

4.6.3 Availability and Use of ICT Tools for Participation in Political Development.

Cross tabulation of availability against use of ICT for political development (Table 4.25) indicates that those who experienced higher availability were more inclined to use ICT for political development. This is observed where 94.1 percent of those who had no availability using ICT for political development at 11% extent. There is a clear effect

seen on participation on development when availability is increased. This is in line with technological determinism theory (Bradley, 2005) who posits that a society's technology drives the development of its social structure and cultural values implying that technology is the key mover and determinant in history and social change. Technology availability here is clearly moving women's participation in development.

Table 4.25: Cross tabulation between availability and Use of ICT for Participation in Political Development

Level of Availability	Extent of Use ICTs for Participation in Political Development in last 12 months					Total
	11%	22%	33%	44%	55%	
0%	94.10%	1.50%	2.90%	1.50%	0%	100%
12.50%	0%	0%	33.30%	66.70%	0%	100%
25%	0%	0%	75%	25%	0%	100%
37.50%	40%	20%	20%	20%	0%	100%
50%	0%	0%	0%	0%	100%	100%
Total	83.70%	2%	7.10%	6.10%	1%	100%

N=390

Chi square test results (Table 4.26) indicated that there was a strong association between availability of ICT and use of ICT for political development ($\chi^2 = 171.581$; $p < 0.05$).

Table 4.26: Association between Availability and Use of ICT for Participation in Political Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	171.581	20	0.000
Likelihood Ratio	56.446	20	0.000
Linear-by-Linear Association	32.236	1	0.000
N of Valid Cases	98		

Significance Level=0.05

4.6.4 Availability and Use of ICT Tools for Participation in Social Development.

The results in Table 4.27 indicate that those who had less availability of ICT used ICT for social development to a lesser extent.

Table 4.27: Cross tabulation between Availability and Use of ICT for Participation in Social Development

Level-of Availability	Extent of Use of ICT for Participation in Social Development in last 12 Months						
0%	90.80%	7.60%	2%	0%	0%	0%	100%
12.50%	3%	92.90%	2.80%	0%	1.40%	1.40%	100%
25%	40%	20%	40%	0%	0%	0%	100%
37.50%	0%	0%	80%	20%	0%	0%	100%
50%	0%	0%	80%	20%	0%	0%	100%
Total	71.80%	22.90%	4.60%	0.30%	0.30%	0.60%	100%

N=390

Chi square test results (Table 4.28) indicated that there was a strong association between availability of ICT and use of ICT for social development ($\chi^2 = 1020.996$; $p < 0.05$). Under social development, women can access e-learning, up to date information, seek

health information, participate in community policing among other activities lack of availability locks women out of social participation that could benefit them immensely.

Table 4.28: Association between Availability and Use of ICT for Social Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1020.996	45	.000
Likelihood Ratio	349.726	45	.000
Linear-by-Linear Association	216.326	1	.000
N of Valid Cases	390		

Significance Level=0.05

4.6.5 Availability and Use of ICT Tools for Economic Development.

Table 4.29 indicates that those who had less availability used ICT for economic development to a lesser extent. Chi square test results indicated that there was a strong association between availability of ICT and use of ICT for economic development ($\chi^2 = 506.321$; $p < 0.05$).

Table 4.29: Cross tabulation between availability of ICT and Use of ICT for Participation in Economic Development

Level-of Availability	Extent of use of ICTs for participation in economic development in last 12 months							Total
	0%	9%	18%	27%	36%	45%	54%	
0%	88.40%	5.90%	1.30%	1.30%	1.30%	1.30%	0.30%	100%
12.50%	2.90%	88.60%	1.40%	2.90%	2.90%	0%	1.40%	100%
25%	0%	0%	20%	40%	20%	20%	0%	100%
37.50%	0%	0%	20%	20%	20%	0%	40%	100%
50%	0%	20%	40%	0%	20%	0%	20%	100%
Total	69.40%	20.80%	2.30%	2.30%	2.30%	1.30%	1.50%	100%

N=390

Table 4.30: Association between availability and use of ICT for Economic Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	506.321	30	.000
Likelihood Ratio	316.360	30	.000
Linear-by-Linear	140.784	1	.000
Association			
N of Valid Cases	389		

Significance Level=0.05

4.7 Effect of Accessibility of ICTs on Women Participation

Accessibility of ICTs was measured skill levels, ICT proficiency and barriers to accessibility.

4.7.1 Accessibility and use of ICTs for Political Development

Table 4.31 indicates that 67% of those who had no accessibility to ICT used ICTs to an extent of 33% for political development. All respondents with 25% accessibility (100%) had used ICT for political development to an extent of 33%. This implied that the greater the access to ICTs the greater the political participation.

Table 4.31: Accessibility and use of ICT for Participation in Political Development

Level OfAccessibility	Extent of use of ICTs for political development in last 12 months					Total
	11%	22%	33%	44%	55%	
0%	33.30%	0%	66.70%	0%	0%	100%
12.50%	0%	40%	20%	40%	0%	100%
25%	0%	0%	100%	0%	0%	100%
37.50%	50%	0%	0%	25%	25%	100%
Total	83.70%	2%	7.10%	6.10%	1%	100%

N= 390

Table 4.32 indicates that there was a significant association between accessibility to ICT and use of ICT in political development ($\chi^2 = 110.872$; $p < 0.05$).

Table 4.32: Association between Accessibility and use of ICT for Political Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	110.872	16	0.000
Likelihood Ratio	50.055	16	0.000
Linear-by-Linear Association	27.641	1	0.000
N of Valid Cases	98		

Significance Level =0.05

4.7.2 Accessibility and use of ICTs for Participation in Social Development

Table 4.33 indicates that all respondents with 100% of the respondents with 50% accessibility used ICT for social development to an extent of 10-27%. While 91% of those who had no accessibility to ICT tools had barely used ICT for social development in preceding 12 months. This shows that accessibility affects participation positively. The study findings agreed with (Sreedevi & Reddy, 2012) that accessibility to ICTs determine women's capacity to participate in the information society and development. Increase in accessibility increased women's participation in political, social and economic development.

Table 4.33: Cross tabulation of Accessibility against Use of ICT for Social Development

Extent of use ICT for social development in last 12 months						
Level OfAccessibility	0-9%	10-27%	28-45%	46-63%	64-100%	Total
0%	91.70%	4.20%	4.20%	0%	0%	100%
12.50%	16.70%	16.70%	33.30%	33.40%	0%	100%
25%	50%	0%	50%	0%	0%	100%
37.50%	20%	20%	40%	0%	20%	100%
50%	0%	100%	0%	0%	0%	100%
Total	71.80%	22.90%	4.40%	0.60%	0.60%	100%

N=390

The results in Table 4.34 indicate that there was a significant association between accessibility and use of ICT for social development ($\chi^2 = 303.231$; $p < 0.05$). The findings would suggest reciprocity between ICTs and social networks for women. DiMaggio and

Hargittai (2001) posits that virtual social support networks which are non-threatening aspect of ICTs for women, availability of others one can turn to for assistance with use, size of networks encourages ICT adoption for women who are known to be late adopters of technology as ICT access also has a positive reciprocal relationship with social networks.

Table 4.34: Association between Accessibility and use of ICT for Women Participation in Social Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	303.231	45	0.000
Likelihood Ratio	91.899	45	0.000
Linear-by-Linear Association	36.592	1	0.000
N of Valid Cases	390		

Significance level=0.05

4.7.3 Accessibility and use of ICTs for Economic Development

Table 4.35 indicates that all respondents with 50% accessibility used ICT for economic development to an extent of 45%. Ninety-three percent (93%) of those who had no access to ICT tools had not used ICT for economic development in preceding 12 months.

Table 4.35: Cross tabulation between Accessibility and Use of ICT for Economic Development

Extent (%) were ICTs used in the last 12 months for Participation for in Economic Development?								
Level-of Accessibility	0%	9%	18%	27%	36%	45%	54%	Total
0%	93.80%	0%	0%	4.20%	0%	0%	2.10%	100%
12.50%	16.70%	0%	16.70%	16.70%	33.30%	0%	16.70%	100%
25%	0%	0%	0%	50%	0%	0%	50%	100%
37.50%	0%	20%	40%	20%	0%	0%	20%	100%
50%	0%	0%	0%	0%	0%	100%	0%	100%
Total	69.40%	20.80%	2.30%	2.30%	2.30%	1.30%	1.50%	100%

N=390

Table 4.36 indicates that there was a significant association between accessibility and use for ICT for economic development ($\chi^2 = 252.994$; $p < 0.05$). This outcome concurs with UN Global Development report which states that ICTs in and of themselves are means for economic advancement and growth so women who through technophobia or lack of ICT skills lack accessibility suffer loss of economic opportunities

Table 4.36: Association between Accessibility and Use of ICT for Women Participation in Economic Development

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	252.994	30	0.000
Likelihood Ratio	99.889	30	0.000
Linear-by-Linear Association	45.063	1	0.000
N of Valid Cases	389		

Significance Level = 0.05

4.7.4 Accessibility: Proficiency in use of ICTs

Results in Table 4.37 showed that in the last 12 months, only 10.3% of the respondents had carried out the computer related activity of sending emails with attachments and 8.6% used copy paste tools indicating low levels of proficiency and efficacy in use of ICTs.

Table 4.37: Proficiency and Efficacy in use of ICTs

Which of the following computer related activities have you performed in the last 12 months	%of respondents
Sending e-mails with attached files -For example, a document, picture, video	10.30%
Using copy and paste tools to duplicate or move information within a document	8.60%
Copying or moving a file or folder	3.40%
Using basic arithmetic formulas in a spreadsheet	3.40%
Transferring files between a computer and other device	2.40%
Which of the following computer related activities have you performed in the last 12 months	%of respondents
Creating electronic presentations with presentation software -Including text, images, sound, video or charts	1.40%
Connecting and installing new device –e.g., a modem, camera, printer.	1%
Finding, downloading, installing and configuring software	0.70%

N=390

4.7.5 Barriers to Internet Accessibility

Table 4.38 shows the responses to the questions on barriers to internet accessibility. Majority 29.1% of the respondents stated lack of confidence, knowledge or skills to use the Internet. Others (28.8%) do not need Internet-Not useful, not interesting, and too busy and lack of local content. Privacy or security concerns (23.6%) came a distant third.

Table 4.38: Barriers to Internet Accessibility

Why do you not have internet access?	Percent
Lack of confidence, knowledge or skills to use the Internet.	29.10%
Do not need Internet-Not useful, not interesting, am too busy, lack of local content	28.80%
Privacy or security concerns	23.60%
It does not correspond to my needs -For example, quality, and speed	8.90%
Cultural reasons-For example, exposure to harmful content	0.30%

N=390

The Soft Systems theory (Checkland, 1981) which argues that for an ICT solution to be viable, social and political elements that confound the problem definition and resolution must be taken into account, as much as the technical functionality. The Task Technology Fit Theory (Goodhue et al, 1995) holds that access to ICTs is more likely to have a positive impact and be used if the capabilities of the ICT match the tasks that the user must perform. This confirms the findings of the study which show that the second highest barrier to Internet accessibility was the lack of functionality or task technology fit. The Social Construction of Technology Theory (Pinch and Bijker, 1984) argues that different social groups evaluate and interpret success or failure of technology based on their objectives, goals and intentions. The Adaptive Structuration Theory (DeSanctis and Poole, 1994) in contrast to the techno centric view of technology use, emphasizes the social aspects because groups create perceptions on the role and utility of ICTs which influence use of ICTs and subsequent outcomes on the groups. This then means that women's perception of the role ICTs in their day to day lives greatly influences their use of ICTs.

The ambivalence theory (Zhang, 2008) lends support to this by positing that technology is contextualized and as a result either accepted or rejected based on cultural, socio-

political and economic state of a society and indicate that barriers to women’s access ICTs are based on their cultural, socio-political and economic status in society. These theories emphasize that for ICTs to be viable there’s need for ICTs to have the capacity to resolve user problems, meet user needs as well as assist the user perform tasks.

4.8 Conceptual Model

In conducting the study, a conceptual framework was used to show the relationship between the independent variable and dependent variables (Refer to chapter two). In the study the independent variable is defined as access to ICTs tools which are affordability, availability and accessibility while the dependent variables are women participation in economic, political and social development. The study tested the significance of the independent variables through multilinear regression. The ratings provided for each variable was used as control variables. The results are presented in Table 4.39 to 4.41

Table 4.39 presents the results of the model summary indicating the r, r squared and the adjusted r squared.

Table 4.39 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.649	0.421	0.411	0.929

- a. Predictors: (Constant), Accessibility, Affordability, Employment Status, Age, Education, Availability

Table 4.39 indicates that the three variables used (availability, accessibility and affordability) can explain 42.1% (R squared = 0.421) of the change in use of ICT tools for development. This indicates that there are other factors that were not included in the model that explain 57.9 percent of the change in use of ICT tools for development by women.

Table 4.40 presents the results on the model fit (f test) and statistical significance of the whole model.

Table 4.40 ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	212.332	6	35.389	41.017	.000 ^b
Residual	291.622	338	0.863		
Total	503.954	344			

a. Dependent Variable: Use of ICT for development

b. Predictors:(Constant), Accessibility, Affordability, Employment Status, Age, Education, Availability

Table 4.41 indicates the overall model was a good fit for the data ($F=41.017$; $p<0.05$). This indicates that the model can be used to estimate the use of ICT for development by women. The significance of the model indicates that the three independent variables can be reliably used to estimate use of ICT for development by women.

Table 4.41 Significance of Independent Variables

Model	Unstandardized		Standardized		Sig
	Coefficients β	Std Error	Beta	T	
1 (Constant),	-1.147	0.496		-2.313	0.021
Age	-0.216	0.053	0.174	-4.076	0.0000000
Education	0.356	0.067	0.263	5.324	0.0000000
Employment Status	-0.103	0.069	-0.064	-1.504	0.134
Affordability	0.026	0.103	0.011	0.254	0.799
Availability	0.73	0.081	0.449	9.015	0.0000000
Accessibility	0.19	0.091	0.096	2.085	0.038

The results in Table 4.41 indicated that affordability was not a significant factor in determining use of ICTs in development by women ($\beta= 0.026$; $t=0.254$; $p>0.05$). This indicates that improvement on affordability would not significantly affect use of ICT for development. However, this can be due to the fact that those who used ICT tools for development were the ones who rated the costs as high compared to those who did not use ICT tools for development.

Availability of ICT tools was significant in influencing use of ICT for development ($\beta = 0.730$; $t = 9.015$; $p < 0.05$). This indicated that improving availability by a unit would lead to improvement of use of ICTs for development by 0.730.4

Accessibility of ICT tools was a significant factor in affecting use of ICT in development by women ($\beta=0.190$; $t=2.085$; $p<0.05$). This indicates that improving accessibility to ICT tools by a unit would result in increase of the use of ICTs for development by 0.190.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives the conclusions and recommendations arising from the study on the effects of access to ICT tools on women participation in development in Kitale Municipality in Kenya. This study was on women between the ages eighteen to sixty-five in Kitale Municipality in Trans Nzoia county in Kenya. Questionnaires were administered to three hundred and ninety respondents in the ten civic wards in the Municipality. Descriptive and inferential analysis and multiple linear regression were used to analyze data in this study. The purpose of the study was to show significance of access to ICTs on women's participatory inclusion in the national development agenda in Kenya. This study achieved its purpose by finding the most significant variables affecting use of ICTs for women's participation in development.

5.2 Summary

The purpose of this study was to measure the effects of the three components of universal access to ICTs which are affordability, accessibility and availability on women's participation in development as well as the effects of personal characteristics on women's use of ICTs for participation in development in Kitale Municipality. The study adopted a descriptive survey research design and a random stratified sampling technique. The target population was 37,701. The sample size was 390. The stratification was done on the basis of the 10 civic wards in Kitale Municipality. Data collection instrument was a structured questionnaire. Data analysis was done with SPSS statistical analysis software. The study established that affordability was not a significant factor in determining use of ICT in development by women. Availability of ICTs was significant in affecting use of ICT

tools for development. Accessibility of ICTs was significant in affecting use of ICT tools for development. In personal characteristics education was most significant in affecting use of ICTs for development. The study findings were that the most significant variable was accessibility, while the least significant variable was affordability. Among the individual characteristics the study found education to be the most significant. The study concluded that increase in availability of ICTs, education and accessibility of ICTs had a positive impact on women's participation in development while affordability did not.

5.3 Conclusions

The study was targeting the area of bridging the gender digital divide which is a key area in ICT policy and regulation. Policy can only be effective if it is informed by facts on the ground, this study has been able to provide gender specific research for policy makers and important information that is required by both scholars and practitioners in this area.

5.3.1 Effects of Affordability of ICTs on Women's Participation in Development in Kitale Municipality

The study findings differed with Doria (2012) who stated that income and education disparities are key contributory factors in affordability of data services as 97% of respondents across the income, age and education divide found ICTs unaffordable. The study concluded that the high cost of ICT equipment and service hindered the use of ICTs to participate in development in Kitale municipality however even among the minority who disagreed that the costs were too high use of ICTs to participate in development remained marginal.

5.3.2 Effects of Availability of ICTs on Women's Participation in Development in Kitale Municipality.

The study concluded that availability of ICTs was significant in explaining women participation in social, economic and political development. In regard to availability, the

study findings were that increase in availability increased women participation in the social, political and economic development using ICTs.

5.3.3 Effects of Accessibility of ICTs on Women's Participation in Development in Kitale Municipality

The study concluded from its findings that increase in accessibility of ICT increased women's use of ICTs for participation in development. The Task Technology Fit Theory (Goodhue et al, 1995) holds that access to ICTs is more likely to have a positive impact and be used if the capabilities of the ICT match the tasks that the user must perform. This confirms the findings of the study which show that the second highest barrier to Internet accessibility was the lack of functionality or task technology fit. This is echoed by the Technology Acceptance Model presented by Davis (cited by van Akkeren & Cavaye, 1999) suggests that when a user is presented with a new technology, a number of factors influence the decision regarding how and when they were used. This includes its perceived usefulness and its perceived ease of use which is defined as accessibility. Affordability of ICTs according to this study was concluded as not being a significant predictor of use of ICT for participation in development by women.

5.3.4 Personal Characteristics and use of ICTs for Women's Participation in Development in Kitale Municipality

The study concluded that access to mobile phones is very high while access to computers and internet is low among women in Kitale municipality and that most of those who had used computers and accessed internet in the last twelve months prior to the study were young. The study also concluded that access to and use of ICTs by women was significant in explaining their use of ICTs in participation in development. Studies indicate that technological anxiety continues to correlate significantly with individuals' characteristics, most notably gender and age (Bauer, 1995) the findings of this study confirmed that age affects women's use of computers and the internet. The study further

concluded that being employed for the women was related to higher probability of using computers and accessing the internet. The self-employed used ICTs most to participate in political and economic development while employees used ICTs most to participate in social development. Murdock *et al.* (1996) observations coincide to the findings of this study as illustrated on the table below, that, material resources and economic capacity play a central role in determining (i) whether women use ICTs and then (ii) the nature and subsequent patterns of that use. The economics of gaining access are, therefore, an obvious prohibitive factor to women using ICT. The study concluded that respondents with Post tertiary education level used ICTs most to participate in political, social and economic development. Psychologists weighing in on this discourse point towards a range of cognitive and affective factors as important in determining women's engagement with technology - such as perceived ease of use, self-efficacy, perceived behavioral control and perceived ability (Zhang, 2008). The findings of the study showed that education levels indicative of cognitive abilities of respondents contribute to women's use of ICTs for participation in development in Kitale Municipality.

5.4 Recommendations

This section covers the recommendations made based on the findings of this study.

5.4.1 Recommendations on Affordability of ICTs on Women's Participation in Development

Government agencies such as Communication Authority of Kenya and ICT board of Kenya should put in place policies such as price caps to encourage reduction in the cost of ICT tools and services or subsidize costs of both ICT equipment and services so as to make them affordable as according to the findings of the study ICTs were unaffordable across the board for over 97% of the respondents. The study agrees with policy recommendations (Samarajiva, 2009) that the most pressing issue is affordability and recommends that due to the importance of mobile phones in connecting large numbers of

people particularly at the bottom of the pyramid to the global internet economy as compared to the conventional PC-route, focus on making both mobile phones and internet bundles more affordable for the majority of Kenyans living below the poverty line. The study recommends that as affordable access to mobiles has already happened in Asia through intense competition and business innovations (Samarajiva, 2009) the lessons learnt in Asia may provide valuable insights into how Kenya and its county governments can achieve similar levels of affordability.

5.4.2 Recommendations on Effects of Availability of ICTs on Women's Participation in Development.

On availability, Government in conjunction with other stakeholders such as development partners, communication providers, Communications Authority of Kenya and universal fund should promote use of ICT in the rural areas through promoting infrastructure projects in support of ICT to ensure universal access in rural areas as only a third of the respondents had internet access available in their respective areas. The study therefore recommends that there is need to prioritize utilization of the universal fund into rapid infrastructure expansion towards availability of internet in rural and peri-urban areas simply because greater availability of internet will spur women's participation in development more so in less developed areas such as Kitale.

5.4.3 Recommendations on Effects of Accessibility of ICTs on Women's Participation in Development

This study recommends that since accessibility positively affects women participation in development even in largely rural areas, policy geared towards ways to increase functionality of the available ICTs so that women naturally gravitate towards rather than fear technology. If ICTs that government initiatives towards the female populace are customized to the unique roles women play in society and the unique constraints they face, then accessibility will be higher than merely providing skills.

5.4.4 Recommendations on Effects of Personal Characteristics on use of ICTs for Women's Participation in Development

The study agreed with the findings of the ICT policy of Kenya of 2006 that engendering ICT policies at all levels and ensuring participation of women in ICT policy formulation and implementation is a key challenge of ICT in national development more so in regards to targeting older, less educated women and the most economically vulnerable women. The study found that older, less educated and unemployed women also require affirmative policy interventions to bridge the digital divide and their female counterparts who are younger, more educated and gainfully employed.

5.4.5 Recommendations for Further Research

The researcher recommended conducting the following follow up studies: a qualitative study on the effects of ICTs on women's participation in development in Kitale Municipality particularly in the sectors of care delivery, education and training and a study of the effects of ICT access on key areas of our economy such as agriculture, tourism, trade and financial services especially in regards to marginalized groups such as women. A comparative study on the effects of access to ICTs on women's participation in development in urban and rural areas. Finally, the researcher recommends research into gender disparities in awareness levels on the available ICT applications and services as well as on their perceived usefulness and ease of use as per the Technology Acceptance Model (Venkatesh et al,2003).

The current study was completed using structured questionnaire a similar study should be planned within the same study area that uses focus group and to targets a smaller population so as to get more detailed and broader range of information due to the wide scope of ICT access. The study can then focus in more detail on the thick concepts of ICT

access (Burbules & Callister,2000) as well as on the three models of ICT adoption (Venkatesh et al.,2003) and include men so as to enlighten policy makers on the gender differences in this area and need for gender specific ICT policy framework. Since this study was mainly guided by and has in its findings affirmed the Soft Systems theory (Checkland,1981) and Task Technology Fit(Goodhue et al.,1995), a study guided by opposing theories is recommended by this researcher as a means to enhance existing theories on ICT access and come up with new ones as most of the existing ones at this time are over five years old and much has changed in this field of study over that period.

In conclusion, the study established that affordability was not a significant factor in determining use of ICT in development by women. Availability of ICTs was significant in affecting use of ICT tools for development. Accessibility of ICTs was significant in affecting use of ICT tools for development. In personal characteristics education was most significant in affecting use of ICTs for development. The study findings were that the most significant variable was accessibility, while the least significant variable was affordability. Among the individual characteristics the study found education to be the most significant. The findings of this study are extremely pertinent in informing ICT policy in Kenya particularly in this budding era of devolution where development is being decentralized from the urban down to the rural areas. The study findings will inform the ICT policy agenda of bridging both the rural urban and the gender digital divides. The key issue of providing a gender specific and gender transformative ICT policy framework is clearly brought out by this study and can make the Kenyan ICT policy more effective if implemented.

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APPENDICES

APPENDIX 1. QUESTIONNAIRE

Section1: Individual Characteristics

1. Age(years): Please tick only one.

[] 18- 25 [] 25-35 [] 35-45 [] 45-55 [] 55 -65

2. Highest educational level attained. Please tick only one.

Primary education or lower

Lower secondary education

Upper secondary education or post-secondary, non-tertiary

Tertiary (Undergraduate Degree)

Post-tertiary (Post-graduate Diploma, Masters or PhD)

Note:

-Only one educational level can be selected.

3. Current employment status. Please tick only one.

Employee

Self-employed

Others (after ticking go to Q5)

Section 2- ICT access and use among women in Kitale Municipality

1. Have you used a mobile telephone in the last twelve months? Please tick only one.

Yes

No

2. Have you used a computer(desktop, laptop, tablet or similar)

from any location in the last twelve months? Please tick only one.

Yes No

3. Have you used the Internet from any location in the last twelve months?

Please tick only one.

Yes <input type="checkbox"/> No <input type="checkbox"/>
--

Section3: Women’s Participation in Development in Kitale municipality

PART A: ACCESS TO ICTs FOR POLITICAL DEVELOPMENT

(Please Tick All that Apply)

1. In the last 12 months have you used new ICT tool(s) i.e. Computer, internet or Mobile phone to do the following? Tick all that apply

- a) Access political information and civic education
- b) Learn about the constitution and your constitutional rights
- c) Check your voter registration details,polling station and status
- d) Get information on political events, parties and candidates, election dates and results
- e) To follow parliamentary proceedings,debates and current affairs
- f) To participate in political debates, access your representative interact with constituents and contribute to political discussions
- g) To campaign for or finance a political party or candidate
- h) To register online for political activities
- i) To browse government websites, access government services such as police P3 form and enquire on information disseminated by government

PART B: ACCESS TO ICTs FOR SOCIAL DEVELOPMENT

(Please tick all that apply)

1. In the last 12 months have you use new ICT tool(s) i.e. Computer, Internet or Mobile phone to do the following?

- a) Increase contact with those who share similar religious beliefs, political views
- b) Access religious, inspirational, entertaining and recreational material such as music, videos
- c) Increase contact with those who share similar hobbies and interests, blogging
- d) To access social support, encouragement and mentorship
- e) For socializing, dating and increased contact with family & friends via social media, skype, email, online chat or sms
- f) Increase contact with business associates, customers, students, teachers
- g) Online appointment booking or license or certificate application e.g. marriage, death and birth certificate
- h) To download government forms such as P3, police abstract, KRA tax returns forms, PIN application
- i) To access e-library services and online publications, online newspapers and magazines
- j) To seek health information on injury, disease and nutrition
- k) Access to learning, computer based training and up to date information

PART C: ACCESS TO ICTs FOR ECONOMIC DEVELOPMENT

(Please Tick All that Apply)

1. In the last 12 months have you used new ICT tool(s) i.e. Computer, internet or Mobile phone to do the following?

- a) Advertise, search for, get information on goods and services
- b) To buy or sell goods and services
- c) Make savings, send or receive money or get information on how to do it

- d) Find out about/ apply for/get loans(e.g Mshwari) /payback loans
- e) To get information on funding, economic and job opportunities
- f) Use internet or mobile banking get information on and transact on bank accounts or shares
- g) Online financial management such as to pay via money transfer for online utilities e.g. water, electricity, amenities, security, bus tickets, fees,
- h) Looking for a job /submitting job applications
- i) Participating in professional networks like Linkedlyn and Xing
- j) To support business operations e.g. to send letters and plan work
- k) ICTS have offered you economic opportunities

2)Please list any other activities that may not be listed above which you have used new ICT tool(s) i.e. Computer, internet or Mobile phone to do used in the last 12 months?.....

Section 4 - Effects of Affordability of ICTs on Women’s Participation in Development

(Please Tick All that Apply)

1) Is the cost of the equipment i.e. mobile phone and computer too high?

-
- 1=strongly disagree 2=disagree 3=undecided 4=agree 5=agree strongly**

2) Is the cost of the service i.e. airtime and internet bundles too high.

-
- 1=strongly disagree 2=disagree 3=undecided 4=agree 5=agree strongly**
-

3) Have you been able to access free internet, such as free Wi-Fi in the last 12Months-Tick only one

-

1=never 2=rarely 3=sometimes 4=often 5=very often

4) Have you been able to access cheaper ICT tools on offer or service offers such as offers of cheaper talk time and internet by your service provider in the last 12 months?

1=never 2=rarely 3=sometimes 4=often 5=very often

Section 5- Effects of availability of ICTs on women's participation in development

1) Is Internet service available in the area. Please tick only one

Yes No

2) Where did you use the Internet in the last 12 months?

Please tick all that apply.

Home

Work

-Where a person's workplace is located at his/her home, then he/she would answer yes to the home category only.

Place of education

-applies only to students-teachers and others who work at a place of education would report 'work' as the place of Internet use; where a place of education is also made available as a location for general community Internet use, such use should be reported in the Community Internet access facility category.

Another person's home

-The home of a friend, relative or neighbor.

Community Internet access facility

-Typically free of charge; includes Internet use at community facilities such as public libraries, publicly provided Internet kiosks, non-commercial telecentres , digital community centres , post-offices, other government agencies; access is typically free and available to the general public.

Commercial Internet access facility

-Typically not free of charge; includes Internet use at publicly available commercial facilities such as Internet or cybercafés, hotels, airports etc., where access is typically paid.

In mobility –use of the Internet while mobile

-Via a mobile cellular telephone, including devices with mobile telephone functionality.

-Via other mobile access devices, e.g. a laptop computer, or other hand held device connected to a mobile phone network.

Other locations (please specify)

Note:

-This question is only asked of individuals who used the Internet in the last three months.

-Access via a mobile device should be classified to the appropriate location or to ‘in mobility’, that is, while mobile.

-Record all locations where individuals used the Internet (that is, allow multiple responses).

-Can replace the Community and /or Commercial Internet access facility categories with those that reflect the types of facilities available in the community.

3) How often did you typically use the Internet during the last twelve months (from any location)? Please tick only one

At least once a day

-Once a working day for respondents who only (or most frequently) use the Internet from work or school etc.

At least once a week but not everyday

Less than once a week

Additional question notes

-This question is only asked of individuals who used the Internet in the last three months.

-Only one frequency can be selected.

-The question refers to a typical period; therefore, respondents should ignore weekends (if they only use the Internet from work or school) and breaks from their usual routine, such as holidays.

Section 6 -To determine effects of accessibility of ICTs on women's participation in development

1) Why do you not have Internet access? Please tick all that apply

Do not need the Internet

-Not useful, not interesting, am too busy, lack of local content.

Lack of confidence, knowledge or skills to use the Internet

Privacy or security concerns

**Internet service is available but it does not correspond
To my needs –For example, quality, speed.**

**Cultural reasons
-For example, exposure to harmful content.**

**2)Which of the following computer-related activities have you
carried out in the last twelve months? Please tick all that apply.**

Copying or moving a file or folder

**Using copy and paste tools to duplicate or move
information within a document**

**Sending e-mails with attached files
-For example, a document, picture, video**

Using basic arithmetic formulas in a spreadsheet

**Connecting and installing new devices
-For example, a modem, camera, printer.**

Finding, downloading, installing and configuring software

**Creating electronic presentations with presentation software
-Including text, images, sound, video or charts**

Transferring files between a computer and other devices

