

Challenges that Affect Participation of
Women in Accessing and Using Information Communication Technologies:
A Survey of Women Professionals in Information Technology Departments
in Universities within Nairobi

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DECLARATION

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

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DEDICATION

All Glory and Honour to God who has seen me through during this entire study period. I would like to dedicate this work to my Dad, Mum, my brothers Samuel and Alex who continually gave me spiritual, moral and financial support during this period of study may God richly bless you.

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

ICT	Information Communication Technology
OECD	Organisation for Economic Cooperation for Development
IT	Information Technology
TV	Television
ITU	International Telecommunications Union

DEFINITION OF TERMS

Information Economy

Economy in which knowledge is the primary raw material and source of value. It is characterized by convergence and integration of communication and data processing technologies into information technology (IT)

Information Society

An information society is a society in which the creation, distribution, diffusion, uses, integration and manipulation of information is a significant economic, political, and cultural activity.

Technophobia

Abnormal fear of the use or effects of technological developments on society or the environment fear of using technological devices, such as computers

ABSTRACT

The overall objective of this study was to identify the challenges that affect effective participation of women in accessing and using ICTs and the measures to overcome these challenges. The women here refer to the women professionals working in Information Technology (IT) departments of Universities within 50kms radius of Nairobi.

A census would be appropriate in this case because the population is small. The research instrument that was used in the study was a questionnaire which comprised of open and closed ended questions. The data was analysed using quantitative techniques.

From the findings we conclude that information communication technologies have or can create economic opportunities for women. However, more women should be encouraged to venture into entrepreneurial activities which make use of information communication technologies. ICT can be used as a tool for socio-political empowerment to bridge the gender socio-political digital divide. Women should be directly involved in the content development process. On the basis of the findings from this study the following recommendations were made: The government should get into partnerships with telecommunications companies to encourage or promote universal access. The government should subsidize costs of ICT technologies both hardware and software. Encourage private-public partnerships between government, donors and corporate sponsorships for ICT programs to train women through seminars and forums. Women in the ICT sector should mentor girls through mentorship programs e.g. Junior achievement mentorship programs.

Further research should be carried out on how women can be directly involved in the content development process. That way they may be more responsive. Content should be developed in the appropriate language used by women and this can be made possible through education and training. Further research is necessary to find out if promoting universal access translates to reduction of costs to access these technologies by women and how training costs can be reduced to act as an incentive to attract more women.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Information Communication Technologies describes a range of technologies this includes the internet, mobile telephony, satellite communications, and digital television over cables or aerials that are used for gathering, storing, retrieving, processing, analysing, and converting information. It includes both traditional (e.g radio, TV, print, video/film) and newer technologies for example the Internet, virtual reality, distance education applications, mind-computer interface technologies. In the recent past, Information communication technologies have been added to the women and gender equality debate. Information communication technologies are being presented as a tool having potential to benefit women's empowerment (United Nations, 2001).

Women face considerably more challenges with regard to accessing and using Information communication technologies in areas of socio-cultural and institutional barriers, gender segregation in employment, pornography, trafficking and sexual violence through the internet, illiteracy, access to education and information and financial resources. Unless explicit measures are taken to address these divides, there is a risk that information communication technologies will increase gender disparities and that the impact of information communication technology will not be maximized (Gender and Development Group, World Bank, 2002).

There are several arguments that can be made for promoting and encouraging women's equitable participation in information communication technology these are enabling women as active agents, contributing to economic development and mobilizing women for national competitiveness.

Enabling women as active agents

By supporting women as active agents in development, they will be able to improve their incomes, health and food production, which will benefit their families and communities overall. Women's acquisition of more information and knowledge may improve health and decrease the number of children, thereby improving their income-earning ability (Carr and Huyer, 2001).

Increased access by women to information and knowledge resources will benefit their families and communities, in view of their triple roles (reproductive, productive and community) (Huyer and Mitter, 2003). More information and knowledge frequently reduces fertility rates which in turn directly influence economic growth and increases in income (Stiglitz,1998).

Socio-economic benefits of information communication technologies can include increased income and economic empowerment; lack of discrimination, increased social standing and positive media images; increased status and decision-making in the household; and increased self-esteem and potential for mobilization, and increased access to education (Hafkin and Huyer, 2006).

Contributing to national economic growth

According to the World Bank, “Investing in GE [gender equality] and empowerment of women is smart economics”: greater gender equality helps improve economic productivity (2007, Global Monitoring Report on the MDGs). The Bank further argues that gains made to date in the level of available economic opportunities for women lag behind women’s economic capabilities. This inefficiency is related to the fact that women's labor participation and earnings are associated with reduced poverty and faster growth on the premise that men, children and society as a whole benefit as well as women from their economic empowerment. "In sum, the business case for expanding women’s economic opportunities is becoming increasingly evident; this is nothing more than smart economics” (World Bank, 2006). The UN notes that women's informal employment in collaborative, self-help and traditional activities are "a vital economic resource." (United Nations, 2006). Women's entrepreneurship has become recognized as an important source of untapped economic growth – bringing not only job creation but also providing different solutions to management, organisation and business problems (OECD 2004).

Mobilizing women for national competitiveness.

Women’s lack of economic empowerment, on the other hand, not only imperils growth and poverty reduction, but also brings a host of other negative impacts, including less favorable education and health outcomes for children and a more rapid spread of HIV/AIDS (World Bank, 2006).

One of the more pervasive but intractable problems is “technophobia”, the fear of technology. Women often have complex relationships with technology and machines as a result of being socialized over time to believe that machines and technology are a man’s domain and not for women and girls, thus generating a gender bias in attitudes towards studying or using information technology. The social factors that produce these gender differences operate in both institutional and informal settings. In some societies, cultural norms discourage interaction between women and men outside the family, and women may be uncomfortable in situations where men are present either as trainers or as peers (Munyua, 2001).

New Information communication technologies, particularly the internet, facilitate the sexual exploitation of women and children. By enabling people to easily buy, sell and exchange millions of images and videos of women and children, they are exposed to sexual predators who harm or exploit them, often anonymously. Disturbing too is the use of the internet as a tool in the prostitution and trafficking of women. In 1995 an estimated 1.8 million women and girls were victims of illegal trafficking, and the numbers are growing.

The Kenyan Government, private sector and non-governmental organisations have been blamed for weak cyber laws and organisational policies in the country leading to abuse of women’ rights in the cyberspace. A report by the Kenya ICT Action Network, claims use of mobile phones and Internet to stalk, abuse, traffic, intimidate and humiliate women was rampant in Kenya. The study conducted in universities around the country revealed

that 13 per cent of female students in the institutions were victims of cyber attacks or some form of harassment.

In another case in point, Mudhai (2004) observes that the government of Kenya is working towards establishing a master plan for e-commerce, and e-government strategies to make public administration more transparent, efficient and democratic. The author observes that the Government of Kenya (GoK) plans to spend US\$ 5.85 billion (Sh444.2 billion) by 2015 on 1.4 million fixed telephone lines in the rural areas. This is translated to mean an average of 5 lines per 100 people, up from 1.6 per 100 and 2.4 million fixed telephone lines in urban areas. This translates to mean an average of 20 lines by 100, up from 4 per 100.

All these efforts are no doubt a step in the right direction for Africans, as ICTs can and will provide a new window for Africa to accelerate sustainable human development, which would inherently benefit rural women.

On the other hand, the principle problems underlying ICTs and rural development in many African countries are issues of access and exclusion. Bridges.org (2001) illustrate that 'real access' to technology is one of the key elements necessary for integrating technology into society. In other words, is the technology in question available, physically accessible and affordable? For instance, Mudhai (2004) argues that Kenya has been slow to reform the ICT sector due to monopoly, corruption and under-investment.

Neglect in educational development has added to the inequalities that women face in society, due to inadequate educational facilities, resources and manpower, which are

much less in rural areas. Additionally, authors such as Odame (2005: 15) point out that women have less income, education, time, mobility, and face religious and/or cultural constraints that restrict their access to, and use of, technology. Odame further argues that some groups of women (i.e. rural women) are more disadvantaged than younger, more literate or wealthier urban women. In support of these views, Ballantyne, Labelle and Rudgard (2000) contend that the use of ICTs is limited by lack of awareness, skills, training, a shortage of capital resources for sustainability and maintenance, and the low provision of appropriate content, both in terms of language and subject matter.

The African Centre for Information and Communication technology ACWICT is another Kenyan NGO committed to the plight of women/girls in ICTs. Constance Obuya, the executive director, isolates “socio-cultural norms” and “non-gender responsive policies as problem areas that need reviewing” (Obuya, 2003:1).

1.2 Statement of the problem

Women have reduced access to ICTs for a number of reasons, ranging from socio-cultural attitudes and preconceptions about women's interaction (or lack of it) with technology to resource constraints. For the majority of women specific barriers include illiteracy, unfamiliarity with the dominant languages of the internet, absence of training in computer skills, domestic responsibilities and the fact that the information delivered by ICTs is not valuable to them. Infrastructure itself is also a gender issue; it is concentrated in urban areas and more women live in rural areas (Hafkin, 2002a).

Women's access to and control over Information communication technologies is not equal to that of men. Access refers to the ability to make use of technology as well as the information and knowledge it provides, while control refers to the ability to decide how Information communication technologies are used and who can use them. Effective use refers to the ability of women and girls to use Information communication technologies strategically to advance multiple development goals. There is a huge gap between women and men's access to telecommunications infrastructure. Info-communications infrastructure is largely concentrated in urban areas, while the majority of women in the developing world, particularly in Africa, are located in remote and rural areas. Simply stated, if the technology is not there, where women are to be found, then women cannot have access to it, use it or much less control it. (Munyua, 2001).

Neglect in educational development has added to the inequalities that women face in society, due to inadequate educational facilities, resources and manpower, which are much less in rural areas. Additionally, authors such as Odame (2005: 15) point out that

women have less income, education, time, mobility, and face religious and/or cultural constraints that restrict their access to, and use of, technology. Odame further argues that some groups of women (i.e. rural women) are more disadvantaged than younger, more literate or wealthier urban women. In support of these views, Ballantyne, Labelle and Rudgard (2000) contend that the use of ICTs is limited by lack of awareness, skills, training, a shortage of capital resources for sustainability and maintenance, and the low provision of appropriate content, both in terms of language and subject matter.

1.3 Objectives of the study

1.3.1 General Objective

The overall objective of this study is to identify the challenges that affect participation of women in using and accessing information communication technologies in the perspective of women professionals.

1.3.2 Specific Objectives

- a) To identify economic challenges women face in using and accessing information and communication technologies.
- b) To identify challenges women face in acquiring knowledge, skills and capabilities to be able to use information and communication technologies.
- c) To identify the socio-political challenges women face when using and accessing information and communication technologies.
- d) To identify measures to overcome the challenges that women face with regard to accessing and using information communication technology.

1.4 Research Questions

- a) To what extent has ICT created new economic opportunities for women?
- b) How can we encourage more women to take part in ICT education and training?
- c) How can information communication technologies be used as a tool for socio-political empowerment among women?
- d) What methodologies can be put in place to deal with the challenges mentioned above?

1.5 Significance of the study

This study would help identify the core challenges facing or affecting women to access and use new Information communication technologies and as workers in the information economy with the aim of collecting and analysing data that would provide valuable information to the various groups which have a stake in this sector including: Policy Makers: - Policy makers would be better able to make decisions that are geared towards involving more women this is possible through sensitising ICT policy makers to gender issues and sensitizing gender advocates to ICT policy issues.

ICT Professionals: For ICT professionals, this study would provide them with useful information to enable them recommend and implement appropriate policies for the ICT sector. The Society: The society will understand the challenges and importance of ICT with regard to women and embrace and encourage women and in due time socio-cultural and institutional barriers, gender segregation in employment, pornography, trafficking and sexual violence through the internet would be a thing of the past.

1.6 Justification of the study

The justification of the study was to highlight how information communication and technology can empower women economically, socially and politically. Women's social disempowerment is often strongly linked to her isolation from information that she needs, and this includes her ability, opportunity and space (both virtual and non-virtual) to communicate in her own local language with others for this information.

Information communication and technology has been applied as an agent of change in enabling women to participate directly in politics and civic life. The important role provided by information communication and technology enables an increased opportunity for positive facilitation of public and political participations and rightfully serves as an attempt to replace the traditional form of governance and its accompanying deficiencies with a modern, more open, transparent and responsive service delivery system. Socio-economic benefits of information communication technologies can include increased income and economic empowerment; lack of discrimination, increased social standing and positive media images; increased status and decision-making in the household; and increased self-esteem and potential for mobilization, and increased access to education (Hafkin and Huyer, 2006).

1.7 Scope of the study

Women and ICT is an inexhaustible topic however the scope of this research was confined to discuss the core challenges facing or affecting women to access and use new Information communication technologies and as workers in the information economy.

1.8 Limitations

The study will not cover all the Information Communication Technologies such as Mobile Money transfers, mobile telephony and online communities it narrowed down particularly to the use of computers and multimedia devices.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

Despite significant growth in the information communications technology profession, there remains a gender imbalance in the participation of women in ICT (Adya and Kaiser, 2005). In fact, according to Crump et al. (2007) most women do not actively seek to be employed in ICT. Not only their participation in ICT is low compared to their male counterpart, but according to Trauth (2002) there exists gender differences also in computer skills and usage. Despite the increasing use of computers at schools, homes and workplaces, researches continue to report high levels of anxiety, resistance and poor attitude towards computer usage among students of higher level education who are preparing for professional careers as well as among employees who are already established in the workplace.

Specifically, male students have more positive attitudes towards computer than female students. For example, a study by Broos (2005) found that males demonstrate greater sex role stereotyping of computer, higher computer self-efficacy, and more positive attitudes towards computer usage than females. In fact, wide variety of issues related to women under representation has been investigated with regard to why women are under represented and how to narrow the IT gender gap. Such issues include social contexts, media influences, gender stereotypes, education and work environment, as well as recruitment and retention (Adam et al., 2002; Trauth and Howcroft, 2006).

Discussion of gender issues in connection with new ICTs derives in part from earlier analyses about women and technology, and women and media. During the 1990s, gender issues in communication and media focused on three broad issues: the equitable access of women and women's organizations to the means of public expression; women's access to professional careers and decision-making positions that have traditionally been male preserves; and the portrayals of women reinforcing or changing stereotypes. More recently, there has been a shift from an emphasis on women solely as objects of information to a focus on women as controllers of information – in other words not only changing the way women are talked about, but also enabling more women, particularly marginalized women, to create their own information and spread their own messages through the new ICTs (Burch and Leon, 2000).

To consider along with enabling women gain access to relevant information using Information communication technologies is the facilitation and support for women.

Content: Women should be directly involved in the content development processes. That way they are more responsive. Content should be developed in the appropriate language used by women. Universal Access: Infrastructure is key in enabling and providing access to information communication technologies. There should be infrastructure investment strategies that provide basic and affordable infrastructure. Through universal access and a focus on adult literacy make ICT tools available to women. Human Resource Development – In order for women to effectively participate in using information communication technologies for economic empowerment they need to be empowered

themselves. The young girls must have access to the education and technologies for development. There should be equal access to training in ICTs at all levels. Governments should include in the curriculum of training in ICTs right from lower levels and in addition ensure training of girls and adult literacy for rural women. Create Awareness: The only way that women are going to understand the potential of information communication technologies to economically empower them is to tell them about it. Women groups and movements must document and share experiences in order to increase women's participation in the use of ICTs to economically empower them. (Mjumbi, 2002).

2.2 Theoretical Framework

Theories are constructed in order to explain, predict and master phenomena (e.g. relationships, events, or the behavior). In many instances we are constructing models of reality. A theory makes generalizations about observations and consists of an interrelated, coherent set of ideas and models (Khan, 1999).

Radical feminist theory argues that women are victims of patriarchal practices which perpetuates male domination over women. Conservative theorists view gender differences as a natural necessity which should be maintained for the good of the society on the basis of complimentary roles (Open university, 1989). The Marxist feminists blame capitalism as the cause of social differences between men and women. Subordination of women is, therefore, a product of capitalism which is characterized by class conflict and oppression (Fagerlind and Saha, 1989).

Other scholars blame exotic technology and formal education for the current state of women. For example, chambers (1983) argues that policy makers have not done enough

to integrate modern technology and the needs of women. There is further evidence that formal education has promoted alien behaviours which are incompatible with traditional values and therefore discourage girls and women from participating in modern education or development activities (Fagerlind and Saha, 1989). These theories imply that traditional practices and negative impact of modern developments have both contributed to the marginalization of women in the participation, access and use of these technologies.

On women education World Bank report states that investment in female education have some of the highest returns for development and for the environment (World Bank,1992) Lind and Johnstone (1989) in their studies on women literacy found that generally adult women face many difficulties in their learning. These are new and traditional roles in the family, Lack of time due to domestic chores, Lack of exposure to other languages other than vernacular and direct discouragement from men who fear rivalry from informed women.

In reference to ICTs Evans (1995) gives almost similar reasons and state the hindering factors such as:

(i) Cultural factors

Cultural and social attitudes often discriminate against women's participation in the fields of science and technology and limit their opportunities in the area of ICT (World Bank, 2002). One of the more pervasive but intractable problems is "technophobia", the fear of technology. Women often have complex relationships with technology and machines as a result of being socialized over time to believe that machines and technology are a man's

domain and not for women and girls, thus generating a gender bias in attitudes towards studying or using information technology. The social factors that produce these gender differences operate in both institutional and informal settings. In some societies, cultural norms discourage interaction between women and men outside the family, and women may be uncomfortable in situations where men are present either as trainers or as peers (Munyua, 2001). This has been captured as Socio-political factors that women face in using and accessing information technologies as one of the dependent variables in the conceptual framework

(ii) Negative attitude of women and lack of qualification in science and technological subjects.

The poor attitude towards science and mathematics has also contributed to current state of women as regards Information Communication technologies. The existing socio-cultural norms have so far restricted girls' and women's access to education training, and employment. Poor training in maths and science subjects at primary level and the lack of exposure to technically oriented subjects, limit their performance in these subjects at secondary school and their access to technical programmes at the tertiary level (Leigh-Doyle, 1991). This has been captured as one of the dependent variables in the conceptual framework as factors of attaining skills, education and capabilities to be able to use these technologies.

(iii) Situational factors such as lack of financial support, family commitments, isolation and lack of moral support from male partners

Women are often financially dependent upon men or do not have control over household expenditures. This makes accessing ICT services more difficult (World Bank, 2002). Women's entrepreneurship has become recognized as an important source of untapped economic growth-bringing not only job creation but also providing different solutions to management, organization and business problems (OECD, 2004). Women's lack of economic empowerment, on the other hand, not only imperils growth and poverty reduction, but also brings a host of other negative impacts for example less favorable education (World Bank, 2006). This has been captured as a dependent variable in the conceptual framework as Economic challenges that women face in accessing and using ICT technologies.

2.3 Conceptual Framework

The above theories on women and Information Communication Technologies have been integrated with the challenges that women face when accessing and using Information communication technologies to come up with a conceptual framework as shown in figure1.

Dependent Variables

Independent Variable

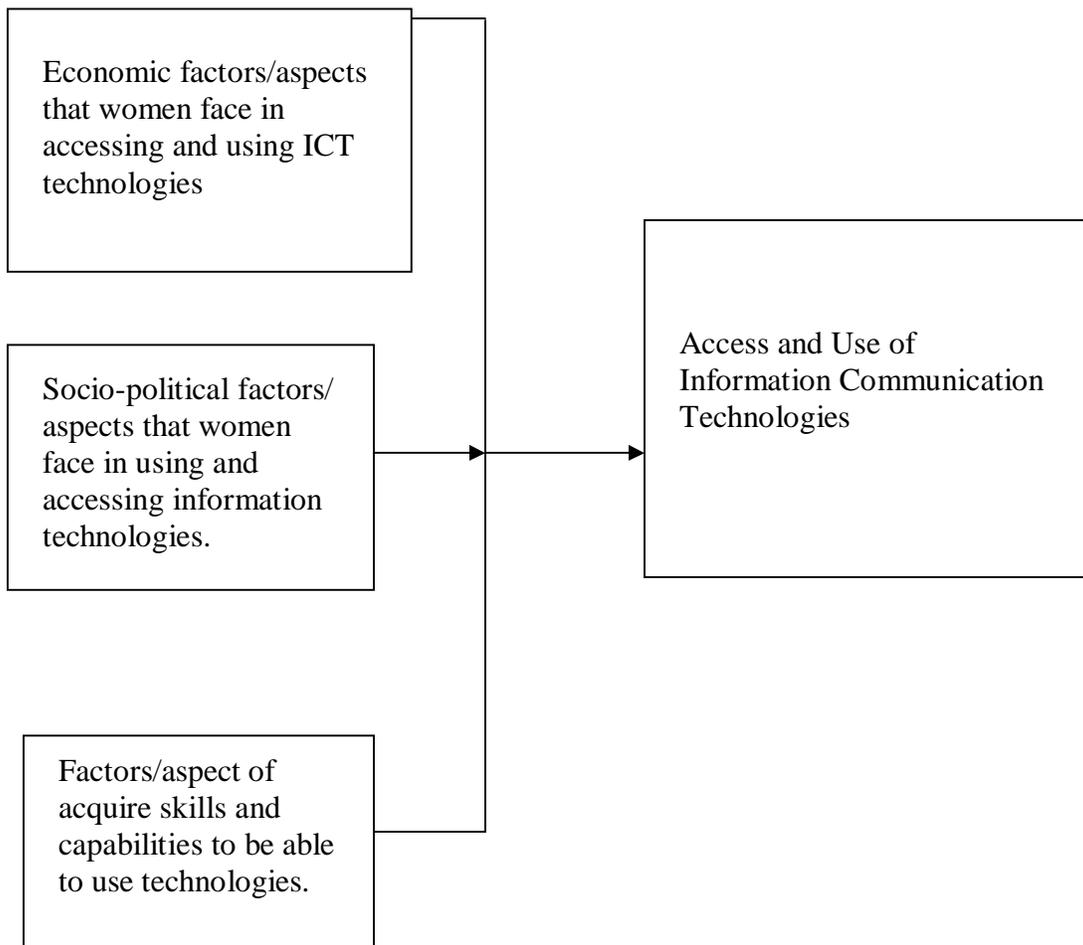


Figure 1: Conceptual Framework

2.4 Socio-political challenges

The participation of women in decision-making is a critical element in ensuring gender-sensitive approaches and outcomes. ICT has the potential for overcoming many of the constraints to communication among individuals and groups in society. Increasingly, women are using ICT for networking and advocacy, and for enhancing their interaction with Government at different levels. ICT should be analysed to see in what ways it can be used to enhance women's capacity in the public sphere. It should also analyse ways in which ICT can provide a context for Governments to work more effectively for women, through increased quality and accessibility of public services, greater accountability and transparency, and enhanced participation of women in decision-making processes. It will develop recommendations for enhancing women's role in participation and decision-making at all levels and in all areas, and for improving gender-responsive participatory governance. (*"Information and communication technologies and their impact on and use as an instrument for the advancement and empowerment of women"* Expert Group Meeting Republic of Korea, 11 - 14 November 2002. The Division for the Advancement of Women (DAW), in cooperation with the International Telecommunications Union (ITU) and the United Nations ICT Task Force Secretariat.

The government needs to urgently increase democratic space for participation by women alongside men and all stakeholder in the formulation of the whole policy process at all levels. With the creation of the Ministry for Information and Communication, the time is particularly appropriate to ensure inclusion of gender concerns in the national ICT policy. Kenya is in the process of elaborating a policy. Gender and ICT lobby groups need to

sensitise policy makers, private sector and other civil society groups, including women's organizations, to the important and critical ICT policy issues.

For disadvantaged groups, including women the stress on social specificity has been particularly refreshing in the context of technology, a branch of applied science. A focus on social and cultural factors has been useful in revealing the marginal role that women have been assigned, for example in the history of technology and science. The formulation and implementation of technologies, in the public domain, have always affected relationships of economic power. The technological innovations become commercially successful if and when the creator of the innovation could make use of political, economic and legal networks. Thus the dominant group in a society determines the shape and direction of a society's techno-economic order – and the image of an inventor has always been male.

Lack of access to relevant networks in the public domain explains the historical marginalization of women's contribution to technological innovations. It is not that women did not advance the technological frontiers, but their role was obliterated from mainstream documentation. It is a worthwhile task to reclaim contributions, but it is equally important to highlight the factors that led to their oblivion. The uneven distribution of economic power explains the differing control over technologies by diverse social groups.

Gender issues in the information society cover a wide spectrum: integrating gender perspectives into national ICT policies; raising awareness among gender advocates about the importance of national ICT plans for gender equality; promoting gender-responsive e-

governance; effective use by women of ICTs and the need for relevant content; promoting women's economic participation in the information economy; promoting democratic media, and combating the use of the Internet to perpetuate violence against women. Due to active advocacy, these issues have gained prominence in recent debates on ICTs and particularly in the run-up to world summit on the information society (WSIS) (Gurumurthy, 2004).

'We affirm that development of ICTs provides enormous opportunities for women, who should be an integral part of, and key actors, in the Information Society. We are committed to ensuring that the Information Society enables women's empowerment and their full participation on the basis of equality in all spheres of society and in all decision-making processes. To this end, we should mainstream a gender equality perspective and use ICTs as a tool to that end.' *Paragraph 12, Declaration of Principles, WSIS, First Phase, Geneva 2000.*

Engendering ICTs is not merely about greater use of ICTs by women. It is about transforming both gender politics and the ICT system. It is evident that the ICT system is organised on elitist, patriarchal, techno-centric, non-democratic lines and based on capitalist values. Transformatory gender politics will need to question these values and search for ethical alternatives. This calls for synergy between a new bottom-up culture of ICT production and use and the reengineering of the global ICT system that will guarantee sustainable changes towards gender equality. Addressing the information communication technology arena is part of a larger struggle to build an information

society based on protecting people's right to communicate, own and use knowledge for their own ends, and resisting curtailments on freedom to use, share and modify information tools and content (Gurumurthy, 2004).

Women are increasingly taking advantage of information communication technologies in all spheres of life, thus confirming that information communication technologies can be a tool to promote gender equality and enhance the economic, political and social empowerment of women. At the same time, a "gender divide" within the digital divide is apparent and reflected not only in the lower numbers of women users of ICT, compared to men, but also in the persistence of gender-specific structural inequalities that constitute barriers to access. In particular, persistent inequalities between women and men at all levels of decision-making constitute serious constraints to women's participation in shaping the role of ICT as a tool for development. Furthermore, as ICT reshape the world of work and commerce, educational opportunities and health systems, they have the potential to perpetuate existing gender-based inequalities in access, use and opportunities, as well as perpetuating gender-based educational, employment, health-related and other disadvantages for women. They may also create new forms of inequality between women and men. It is thus essential to focus on the gender dimensions of the digital divide, not only to prevent adverse impact of the digital revolution on gender equality and to enhance women's equitable access to the benefits of ICT, but also to ensure that ICT can become a central tool for women's empowerment and the promotion of gender equality. Policies need to ensure that the gender perspectives of ICT access and use are fully addressed so

that ICT actively promote gender equality, and ensure that gender-based disadvantages are not created or perpetuated (Hafkin, 2002).

Initiatives undertaken and aimed at providing women with access to ICTs as tools for social and economic empowerment, include the International Women's Tribune Centre (IWTC) CD-ROM project and Centre for Economic Empowerment of Women in Africa (CEEWA) ICT women's project. In an effort to bridge the gender digital gap, International agencies like the International Development Research Centre (IDRC), International Telecommunications Union (ITU), International Institute of Communication Development (IICD), UNDP, UNESCO, World Bank and others have supported initiatives, whose main aim has been to: Discover the role ICTs can play in empowering rural women, Encourage women to take advantage of the developments in ICTs, demonstrate the use of ICTs and how they can facilitate the development process, Provide access to ICTs and ICT-based information (Mjumbi, 2002).

The challenge of incorporating gender issues into recent ICT policy processes has required an advocacy campaign on two fronts: sensitising ICT policy makers to gender issues and sensitizing gender advocates to ICT policy issues. Gender advocates have consistently called for the realization of gender equality within the ICT sector and for ICT diffusion that contributes to positive change in gender relations. Achieving gender equality in ICTs requires more than mainstreaming gender concerns into the ICT arena. It requires serious commitment. The participation of women and individuals with expertise in gender and policy is therefore essential at all stages of the policy elaboration process

so that gender dimensions of policy statements can be identified and addressed (World Bank, 2009).

Given the potential of ICTs in development and social transformation, women in organized civil society have felt that it is essential that the gender digital divide be addressed. The aim is both to ensure women's access to the benefits of ICTs and to make ICTs a central tool in women's empowerment and the promotion of gender equality. Gender issues in the information society cover wide spectrum: integrating gender perspectives into national ICT policies; raising awareness among gender advocates about the importance of national ICT plans for gender equality; promoting responsive e-governance; effective use by women of ICTs and the need for relevant content; promoting women's economic participation in the information economy; promoting democratic media; and combating the use of the internet to perpetuate violence and other crimes against women. There is some consensus regarding the importance of gender focus in information technology and development; but incorporation of gender issues into policy making and implementation (Huyer and Westholm, 2005).

Women have reduced access to Information communication technologies for a number of reasons, ranging from socio-cultural attitudes and preconceptions about women's interaction (or lack of it) with technology to resource constraints. For the majority of women, specific barriers include illiteracy, unfamiliarity with the dominant languages of the Internet, absence of training in computer skills, domestic responsibilities, and the fact that the information delivered by Information communication technologies is not that

valuable to them. Infrastructure itself is also a gender issue: it is concentrated in urban areas and more women live in rural areas (Hafkin, 2002a).

2.5 Challenge of attaining knowledge, skills, capabilities and employment opportunities

Knowledge and information are necessary to ensure optimum benefit from ICT. At the same time, ICT are themselves a source of knowledge and information. Knowledge and information are also essential ingredients for empowerment. ICT should be used as a tool for enhancing women's knowledge and information base, and thus their empowerment. Recommendations should be made to ensure that women have opportunities to develop the necessary skills for using ICT, especially to enhance their education, training, and health. Recommendations should also be made to enhance women's capacity to produce ICT-based knowledge and information, and applications. There should be further discussion on the content of information and knowledge available through the Internet from a gender perspective, and make related recommendations. (*Information and communication technologies and their impact on and use as an instrument for the advancement and empowerment of women*” Expert Group Meeting Republic of Korea, 11 - 14 November 2002. The Division for the Advancement of Women (DAW), in cooperation with the International Telecommunications Union (ITU) and the United Nations ICT Task Force Secretariat.

Philosopher of education Howe (1997) has provided a theoretical discussion of two feminist approaches to gender and education, the humanist and relational approaches, which may prove useful in understanding girls and IT. Humanist feminism “defines

women's oppression as the inhibition and distortion of women's potential by a society that allows the self-development of men'' (Young 1990, 73; quoted in Howe 1997, 39). Under this view, women are limited by cultural norms and expectations, and are not given the same freedom to overcome these bonds as are men. Applying this view to education, one might simply remove obstacles that limit a woman's right to choose certain educational paths, or go further and take compensatory action such as special scholarships for women, affirmative action to redress gender balance issues in public school administration (Hyde and Lina, 2006).

Women face considerably higher barriers in terms of literacy, access to education and information, productive and financial resources, and time. Many of the obstacles women face in accessing and using technology are entrenched in behavioral, cultural, and religious practices. Unless explicit measures are taken to address these divides, there is a risk that ICT will increase gender disparities and that the impact of ICT will not be maximized. Cultural- cultural and social attitudes often discriminate against women's participation in the fields of science and technology and limit their opportunities in the area of ICT, Educational - inequitable allocation of education and training resources often favors boys and men, seclusion- in some countries, women's seclusion from the public arena makes accessing community internet centers difficult (World Bank, 2002).

Technological change usually involves changes in job content, making many traditional skills obsolete and creating a demand for new types of skills. Training and retraining ensure not only that the enterprise obtains the optimal benefits from new technologies, its

also an effective way of protecting the employment of workers affected by technological change and other structural changes.

Changes in work methods caused by the introduction of computerization affect the content of work as well as the skill needed by employees. The direction of changes is, however not uniform. Two divergent tendencies can be observed. In routine transactions, certain skills of a mechanical nature, which nevertheless require a measure of mental effort and concentration, are no longer required or needed less. The skills replacing them are equally mechanical but call for less mental effort. The level of skills required for the performance of routine transactions therefore actually falls, although the degree of attention and concentration required will be just as high or even higher. In contrast, in the area of customer services computerization offers potential for an increase in both the necessary range and level of skills, for example searching for, extracting and assimilating relevant information in response to a request. The realization of the potential is, however contingent on the relevant organizational decisions being taken by management (Ozak et al.,1992). Computerisation has had positive and negative implications for the work force. It has affected employment levels and workloads and brought increasing pressure for flexibility. It has changed the content of work and brought reduced job security and shift towards more non-bargainable employees, which affects the nature and stability of the union.

The impact of Information Technology on employment is not necessarily uniform. It can reduce clerical work to tedious and repetitive jobs and it can create innovative work and create new skills. It can fragment and control work and workers and it can broaden and

allow more autonomy. The computer rationalization of production can be robust and more democratic or algorithmic and more authoritarian (Albin and Appelbaum, 1998).

Bearing in mind the lack of generalisable evidence, it does appear that the likely impact of information technology on women, and the role they are playing in the information technology area, may be minimal, considering the general status of women in African societies and their position in the technical fields. With the increased penetration of computers in organizations, both in the public and private sectors in Africa, there must have been some impact, however small, positive or negative on women. For instance, the introduction of computers in most government ministries (more women in Africa work in the public sector than in the formal private sector), some jobs undertaken by women may have been eliminated by automation and others may have been created. The introduction of computer based technology into clerical work can build on women's skills and may have given them new opportunities to enhance human skills (Minges, 2003).

The existing socio-cultural norms have so far restricted girls' and women's access to education training, and employment. Poor training in maths and science subjects at primary level and the lack of exposure to technically oriented subjects, limit their performance in these subjects at secondary school and their access to technical programmes at the tertiary level. Silent discrimination and stereotyping still exists in many organizations with the result that even women already in employment are not always given the opportunity to prove their worth (Leigh-Doyle, 1991).

2.6 Economic challenges

At the same time as ICT is creating new economic opportunities, they are also undermining some traditional or existing bases of livelihoods. Measures should be put in place for enhancing women's skills to take advantage of new economic opportunities, avoiding women's segregation into lower-paying ICT-related sectors, and strengthening women's access to new business and entrepreneurship opportunities, including through e-commerce (*"Information and communication technologies and their impact on and use as an instrument for the advancement and empowerment of women"* Expert Group Meeting Republic of Korea, 11 - 14 November 2002. The Division for the Advancement of Women (DAW), in cooperation with the International Telecommunications Union (ITU) and the United Nations ICT Task Force Secretariat.

A major challenge is gender equality in the use of ICTs. Women tend to be 'late adopters', meaning that they often tend to take longer to adopt to and utilize new technology than men. The overall use of the Internet by women is mostly "consumerist", functioning as users, but rarely as providers or active participants. This may be linked to the perception that fields such as engineering and computer science are considered part of the "male" domain in many societies. It is reinforced by gender stereotyping in the media, poor career advice in schools, and lack of career structures within research and development to support women in regards to pregnancy and childrearing. Both access and ability are important parts of training programmes targeting women on the use of technology. Training programmes should also be well coordinated with policy and educational

planning. Although ICTs have become an arena where gender differences have become apparent, ICTs have also proven to be a potential means of overcoming gender disparities in society at large. Its potential to educate people through the spread of information is evident through the use of audio-visual industries, the internet and by using ICT training to empower women. In developing countries, women face many cultural and logistical barriers in the use of information and communications technologies, which are often more readily accessible to men (UNESCO Communications and information resources: 2007).

Despite ICT creating new economic opportunities there are several issues that have concerned unions, employees, especially women these are: Prospects of job losses and declining employment levels, Increase in workloads, Changes in grading and pay and changes in information and control. Economic - women are often financially dependent upon men or do not have control over household expenditures. (World Bank, 2002).

African women have always been active in agriculture, trade and other economic pursuits, but a majority of them are in the informal labour force. In 1985, women shares in African labour forces ranged from 17 percent, in Mali to 49 percent in Mozambique and Tanzania (World Bank, 1989). African women are guardians to their children's welfare and have explicit responsibility to provide for them materially. They are the household managers, providing food, nutrition, water, health, education and family planning to an extent greater than elsewhere in the developing world. This places heavy burdens on them, despite developments such as improved agriculture technology, availability of contraception and changes in women's socio-economic status, which one might think would have made their lives easier. In fact, it would be fair to say that their

workloads has increased with the changing economic and social situation in Africa. Women's economic capabilities and in particular their ability to manage family welfare, are being threatened. Modernisation has shifted the balance of advantage against women. The legal framework and the modern social sector and producer services developed by the independent African countries have not served women well. Most African women, in common with women all over the world, face a variety of legal, economic and social constraints (World Bank, 2001).

In sum, information and communication technology is the essential tool for economic development and material well-being in our age; it conditions power, knowledge and creativity; it is for the time being unevenly distributed within not only within countries but even in gender; and it requires for the full realization of its developmental value an interrelated system of flexible organizations and information oriented institutions. In a nutshell, cultural and educational development conditions technological development, which conditions economic development, which conditions social development and this stimulates cultural and educational development once more (Miller, 2005).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

The chapter describes the method the researcher used to carry out the research in view of answering the questions raised in the research in line with the stated research objectives. The chapter focuses on the research design, area and population sample of the study, sampling methods, sample size, research instruments, and sources of data, approaches of data collection and data processing and analysis.

3.2 Research design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. (Kothari, 2004). A survey research seeks to obtain information that describes existing phenomena by asking individuals about their perceptions, attitudes, behaviour or values. Apart from just describing, surveys can be used for explaining or exploring the existing status of two or more variables, at a given point in time. Surveys are also excellent vehicles for the measurement of characteristics of populations.

According to Mugenda (2003) “A survey is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables”. A survey research is therefore a self-report study which requires the collection of quantifiable information from the sample. Survey research could be descriptive, exploratory or involving advanced statistical analysis.

The research design was not pre-decided it was decided after the data was collected. It was decided after collecting the data that a census would be appropriate in this case because the population is small. All items in the population were covered.

3.3 Target population

The study was done in institutions of higher learning particularly universities which are University of Nairobi, Kenyatta University, KCA University, Strathmore University, Jomo Kenyatta University of Agriculture and Technology, USIU and Daystar University which are situated within Nairobi environs as shown in Table 1 below. The population of the study are the women whose area of specialization is Information Technology and who work in the information technology department of the respective institutions.

3.4 Sampling

A complete enumeration of all items in the population is known as a census enquiry. A census would be appropriate in this case because the population is small. The time that the target population data was obtained was in March 2009 things may have changed since then.

Table 1: Target Population

INSTITUTION	POPULATION FREQUENCY
UNIVERSITY OF NAIROBI	8
KENYATTA UNIVERSITY	2
KCA UNIVERSITY	5
STRATHMORE UNIVERSITY	15
DAYSTAR UNIVERSITY	10
JKUAT	21
USIU	3
TOTAL	64

3.5 Research instruments

The research instrument used were questionnaires which were divided into open ended and closed ended questionnaires. The questionnaire is divided into three main sections. Section A comprises of the economic challenges women face in accessing and using information technology. Section B will seek information on the challenges women face in attaining knowledge and skills in using information technology. Section C seeks to find out what measures can be put in place to overcome these challenges. Questionnaires are used to obtain important information about the population. Each item in the questionnaire is developed to address a specific objective or a research question.

3.6 Data collection techniques

The primary data was collected by use of questionnaires and structured interviews. Open and closed ended questionnaires were used. First, permission was sought in order to administer the questionnaires for the collection of data. After permission was granted the researcher dropped the questionnaires to the selected respondents and picked them up after two weeks.

3.7 Data collection procedure

Primary data presents the actual data that was obtained for the purpose of the research study from the answered questionnaires, interviews and observed facts. Collection of secondary data was achieved through journals, books and magazines.

3.8 Data analysis

It involved interpreting information collected from the respondents. Once the questionnaires were completed and collected from each respondent, the researcher compiled them. It involved data editing, data coding and data tabulation. Quantitative data was analysed in a systematic way in order to come with some useful conclusions and recommendations. The researcher will obtain detailed information about the study and try to establish patterns, trends and relationships from the information gathered. The data was presented in cross tables and percentages.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results obtained from the study. It consists of detailed research findings. It is organized under various subsections with a purpose of analyzing and presenting the results.

4.2 General characteristics

Education

A majority of respondents were degree holders which makes up 56.9 % followed by diploma 17.6%, certificate holders 13.7% a distant third and Masters level 11.8% fourth followed in that order as shown in Table 2 below.

Table 2: Level of Education of Respondents

Level of education	Frequency	%
Certificate	7	13.7
Diploma	9	17.6
Bachelors	29	56.9
Masters	6	11.8
Total		100.0

Age

The findings showed that a majority of the respondents were of the age of 21-30 years which represents 56.5%. This could indicate that the respondents in this age group have a higher likelihood to be exposed to information communication technologies. In the recent past since the 1980's there has been an explosion in information communication

technology area that might explain why a majority of the respondents fall under this age bracket because they may have gone or are still going to school during this period. The existing socio-cultural norms that have restricted girls' or women that technically oriented subjects are a preserve of the boys or that women cannot venture into science fields are being done away with and the 'younger' generation are embracing the idea.

30.4% of the respondents were between the 31-40 years age bracket. 6.5% of the respondents were 20 years and below followed by 41-50 years which represented 4.3% and finally 2.2% were above 50 years as indicated in Table 3. Women tend to be 'late adopters' meaning that they often tend to take longer to adopt to and utilize new technology than men especially as they advance in years. These may be linked to the perception that fields such engineering and computer science are considered part of the 'male domain' in many societies (UNESCO Communications and information resources, 2007). This can explain the small number in the respondents as they advance in years.

Table 3: Age of Respondents

Age	Frequency	%
20 years and below	3	6.5
21 - 30 years	26	56.5
31 - 40 years	14	30.4
41 - 50 years	2	4.3
Above 50 years	1	2.2

The attitude towards ICT varies by age and level of academic qualification (Alastair and Didier, 2005). The attitudes can affect the level of confidence, the ease, enjoyment and the importance associated with ICT in the organization.

In this subsection the researcher analyses the data that is significant in answering the research questions.

Table 4: A Cross tabulation between Age and Education

		Age					Total
		20 years and below	21 - 30 years	31 - 40 years	41 - 50 years	Above 50 years	
Qualifications	Certificate	1	0	3	2	0	6
	Diploma	0	3	3	0	0	6
	Bachelors	2	20	6	0	0	28
	Masters	0	3	2	0	1	6
TOTAL							46

According to the cross tabulation a majority of the respondents who are degree holders fall in the age bracket between 21-30 years which shows a majority of the younger respondents are more responsive to these technologies this could be an indication that they are more exposed to these technologies due to the recent past explosion in information communication technologies.

4.3 Economic dimension

A majority of the respondents 86.3% agree that information communication technologies have created economic opportunities for women as shown in Figure 2. Information Communication Technology has the potential to create earning opportunities, improve delivery and access to health and education, facilitate information sharing and knowledge creation, and increase the transparency, accountability and effectiveness of government, business and non-profit organizations-all contributing to an enabling environment for development. Thus, by making Information Communication Technology an integral part

of development cooperation, developing countries and their partners can more effectively address and social divides (UNDP, 2002).

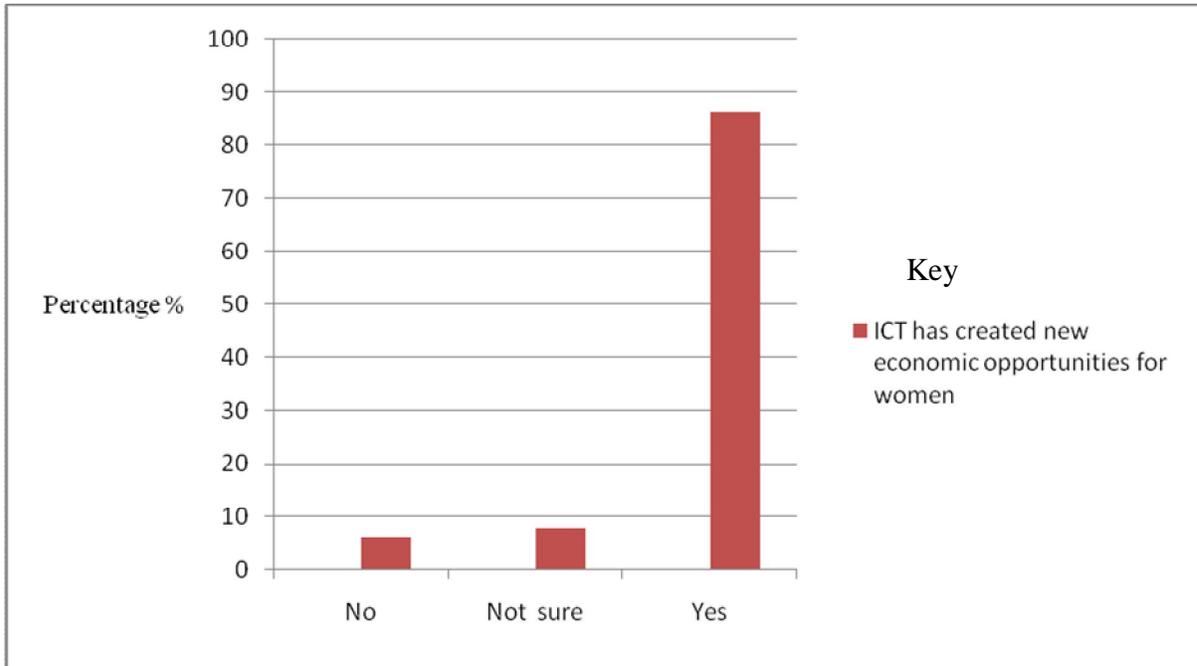


Figure 2: Opportunities ICT has created

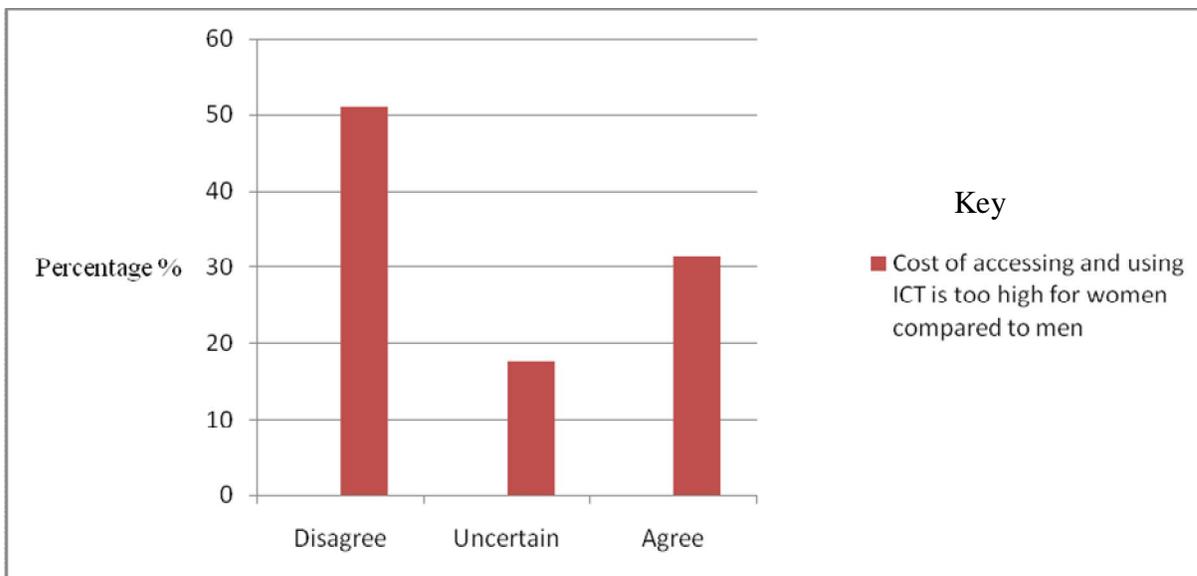


Figure 3: Cost of accessing ICTs

According to the respondents 51% disagree that the cost of accessing ICTs is not too high in comparison to their male counterparts as shown in Figure 3.

The findings in Figure 2 and Figure 3 indicated that the respondents were in agreement with the following that information communication technologies have created economic opportunities for women and that the cost of accessing information communication technologies is not too high in comparison to their male counterparts.

Table 5: Ways women can be part of ICT economic opportunities

<u>Ways women can be part of ICT economic opportunities</u>	Frequency	Percentage %
Venture into entrepreneurial activities in the use of ICT	19	37.5
Encourage them to study technical IT programs	20	39.21
Mobilizing them to be actively involved in new technologies	9	17.65
Providing access at lower costs	3	5.88
Equal chances of training the ICT	8	15.69
Government to subsidize the cost of ICT	2	3.92
Partnership between government and donors	1	1.96
Vying for senior management posts in ICT	2	5.0
Specific fields in ICT given to women specifically	3	7.5

However, 37.5 % agreed that more women should be encouraged to venture into entrepreneurial activities which make use of information communication technologies this is because at the end of the day particularly in Africa a majority of the women are guardian's to their children's welfare and provide for them materially and therefore these

entrepreneurial activities should translate to income which they so desperately need. Women's entrepreneurship has become recognized as an important source of untapped economic growth-bringing not only job creation but also providing different solutions to management, organization and business problems (OECD, 2004). Women's lack of economic empowerment, on the other hand, not only imperils growth and poverty reduction, but also brings a host of other negative impacts for example less favorable education (World Bank, 2006). A minority of the respondents agreed that providing access to these technologies should be at a lower cost another 3. 5% respondents agreed that the government should subsidize the cost of ICT.

4.4 Attaining skills, knowledge, capabilities and education in information

communication technology

According to the findings in Table 6 the respondents had different views on attainment of skills, knowledge, capabilities and education with regard to information communication technologies. Out of the 64 respondents, only 30 indicated that existing social cultural norms have so far restricted women from accessing education in the ICT field this represents 58.9%. The existing socio-cultural norms have so far restricted girls' and women's access to education, training and employment. Poor training in math's and science subjects at primary level and the lack of exposure to technically oriented subjects, limit their performance in these subjects at secondary school and their access to technical programmes at the tertiary level (Leigh-Doyle,1991). 87.7% of the respondents indicated that women would be encouraged more in ICT education and training if the content was relevant.

More recently there has been a shift from an emphasis on women solely as objects of information to a focus on women as controllers of information- in other words enabling women to create their own information and spread their own messages through information communication technologies (Burch and Leon, 2000). Women should be directly involved in the content development process. That way they are more responsive. Content should be developed in the appropriate language used by women.

Table 6: Factors that affect participation of women to Attain skills, Knowledge and training

Views on attaining skills, training and education	Strongly disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Existing socio-cultural norms have so far restricted women access to education	11.8	21.6	7.8	31.4	27.5
Women can be encouraged more in ICT education and training if content relevant	2.0	0	10.2	40.8	46.9
Promoting UA of these ICT technologies would encourage more women in education	8.3	12.5	12.5	33.3	33.3
Women have gender biased attitudes against studying or attaining skills in IT	15.7	9.8	3.9	49.0	21.6
Illiteracy is a contributing factor that hinders women from participating in the benefits of ICT	5.9	15.7	0	43.1	35.3
Technophobia is a contributing factor that hinders women from participating in the benefits of ICT	3.9	23.5	0	52.9	19.6
Lack of interest in ICT technologies among women	3.9	17.6	0	39.2	39.2

Promoting Universal Access of the technologies would encourage more women this represents 66.6% of the respondents. Infrastructure is key in enabling and providing access to information communication technologies. There should be infrastructure investment strategies that provide basic and affordable infrastructure. However there are those who indicated the reasons why women may not be interested in ICT training and education the reasons were 70.6% of the respondents indicated women have gender biased attitudes against studying or attaining skills in ICT these could be due to socio-cultural factors. A majority of the respondents which represents 78.4% indicated that illiteracy is a contributing factor that hinders women from participating in the benefits of ICT. A majority of the respondents which represents 72.5% respondents gave response that technophobia is a contributing factor that hinders women from participating in ICT. One of the more pervasive but intractable problems is technophobia. Women often have complex relationships with technology and machines as a result of being socialized over time to believe that machines and technology are a man's domain and not for women or girls, thus generating a gender bias in attitudes towards studying or using information technology. 78.4% indicated that a general lack of interest in ICT technologies among women this may be because the respondents cannot relate with these technologies or may ask of what use are these technologies to me.

4.5 Socio-political dimension

The findings indicate that there is a fair rate of participation of women in ICT representing 52.9%. A majority of the respondents which represents 84.3% indicated that ICT can be used as a tool for socio-political empowerment to bridge the gender socio-political digital divide as per Table 7 below.

This corresponds well with the commitment to mainstream gender and the effort to make fundamental changes in opportunity and empowerment as well as the attainment of at least 30 percent representation in recruitment, promotion and appointment of women towards the Kenya Vision 2030 (GOK, 2007).

Table 7: Socio-political dimension

Socio-Political views	Very Poor	Poor	Fair	Good	Very Good
	%	%	%	%	%
Rate the participation of women in ICT	0	9.8	52.9	33.3	3.9
Gender and ICT lobby groups	0	2.0	23.5	58.8	15.7
Lack of access to relevant networks in the public domain explains the historical	0	7.8	15.7	47.1	29.4
Given the potential of ICT in development and social transformation	2.0	0	13.7	35.3	49.0
There is under representation of women in ICT decision making levels including policy	0	2.0	19.6	43.1	35.3

However there were concerns which were raised these were 74.5% of the respondents indicated that gender and ICT lobby groups are not doing enough to sensitize civil society groups, women's organizations and the public on critical ICT policy issues with regard to

women this represents. There is under representation of women in ICT decision making levels this represents 78.4% of the respondents. The participation of women in decision making is a critical element in ensuring gender sensitive approaches and outcomes. ICT should be analyzed to see in what ways it can be used to enhance women’s capacity in the public sphere. It should also analyze ways in which it can provide a context for the government to work more effectively for women, through increased quality and accessibility of public services, greater accountability and transparency, and enhanced participation of women in decision making processes.

Table 8: Cross tabulation between Level of Education and the Rate of participation of women in ICT

Qualifications		Rate the participation of women in ICT				Total
		Poor	Fair	Good	Very Good	
	Certificate	0	5	2	0	7
	Diploma	1	5	2	1	9
	Bachelors	4	14	10	1	29
	Masters	0	3	3	0	6
TOTAL						51

From the cross tabulation table 8 the Certificate, Diploma respondents with regard to rating the participation of women in ICT was small in number as compared to their counterparts of Bachelors and Masters these is because they may not have the real situation on the ground this may be due to lack of enough exposure brought about by more education and having not worked very long in the industry.

Table 9: Cross tabulation between Age and under representation of women in ICT decision making levels including policy

		There is under representation of women in ICT decision making levels including policy				Total
		Disagree	Neutral	Agree	Strongly agree	
Age	20 years and below	0	0	1	2	3
	21 - 30 years	0	4	12	10	26
	31 - 40 years	1	4	6	3	14
	41 - 50 years	0	0	1	1	2
	Above 50 years	0	0	1	0	1
TOTAL						46

From the cross tabulation table 9 presented above a majority of the respondents were between the ages of 21-40 years who were in agreement that there is under representation of women in decision making levels and they may be in a better position to know this because they are not only in the ICT sector but they have been exposed to these information communication technologies as seen in the recent past since the 1980's there has been an explosion in information communication technology area and a majority of them fall under this age bracket.

4.6 Suggested measures for effective participation of women in ICT

According to the findings in Table 10 the respondents had different views on coming up with measures or on the way forward in coming up with effective participation of women in ICT. They therefore provided the following suggestions in the Economic dimension the following measures were suggested Accessibility of technology should be easily available, employing the women who have the skills and knowledge, laws that bid importance of ICT equipments be crosschecked, reduce costs of training in ICT, giving loans/grants/sponsor for ICT programs and more ICT Business opportunities for women.

In the Education and Training dimension in Table 12 the following measures were suggested create awareness on benefits of being informed with the ICTs, Trained women in ICT should train others through seminars and/or forum, Reduction costs of training ICT, Introduce lessons in high school to promote ICT, Offer equal skills/knowledge and education to both boys and girls, Take affirmative action while admitting women to study ICT. In the Socio-Political dimension from Table 15 the following measures were suggested there should be equal chances between men and women, women support/encourage fellow women to be involved in ICTs, seminars and conferences to and enlighten women and introduce ICT subjects in girls schools.

Table 10: Cross tabulation between Economic Measures and Age

Opinion on Economic Measures	31 years and below (%)	31 years and above (%)
Accessibility of technology should be easily available	52.4	25
Employing the women who have the skills and knowledge	19	0
Laws that bid importance of ICT equipments be crosschecked	4.8	0
Reduction costs of training ICT	23.8	33.4
Giving loans/grants/sponsor for ICT programs	0	33.3
ICT Business opportunities	0	8.3

According to Table 10 the respondents strongly agreed that accessibility of technology should be easily available however it is important to note that the respondents who were

31 years and below gave more support to this idea which represents 52.4% as compared to their older counterparts which represents 25% this is because the respondents who are below 31 years have higher literacy levels in these information communication technologies and they therefore appreciate the importance of access to these technologies as compared to their older counterparts who may not understand the significance of access to these technologies.

According to the findings with regard to reduction costs of training in ICT the respondents were in agreement that reduction of costs would be welcome however the respondents who were 31 years and above which represents 33.4% were in more favour to this idea as compared to the respondents who were below 31 years which represents 23.8% this difference in opinion would have been brought about by the fact that the older respondents who are 31 years and above may have more financial responsibilities and therefore may not have the money to go back to school and the idea of loans, grants and scholarships was welcome as compared to their younger counterparts who did not think that grants, loans and sponsorships were important these may be because their parents/guardians may still be paying fees for them or they may not have as much financial responsibilities as compared to their counterparts.

The opinion on Employing women who have skills and knowledge in ICT the respondents who were 31 years and above never responded to this which represents 0% never thought that this could be a way to encourage women economically this may be

because since they are from an older generation and are still familiarizing themselves with these technologies they never imagined a woman would be employed in the ICT sector as compared to the respondents who were 31 years and below which represents 19% who agreed these may be because they have been brought in the generation when these technologies are emerging and evolving and have seen women who have the skills and knowledge getting employed in the ICT sector.

Table 11: Opinion on Economic Measures According to Academic Qualifications

Opinion on Economic Measures according to Academic Qualifications	Bachelors and above (%)	Diploma and below (%)
Encourage them to study technical IT programs	13.3	42.9
Mobilizing them to be actively involved in new technologies	46.7	14.2
Government subsidise the cost of ICT courses	20	14.3
Partnership between government and donors	6.7	14.3
Applying for senior management posts in ICT	13.3	14.3

According to Table 11 the respondents were in agreement that mobilising women to be actively involved in new technologies would be a positive approach in encouraging women to be involved economically in these ICT's however the respondents who had a degree and above which represents 46.7% agreed more strongly as compared to their counterparts who had a diploma and below which represents 14.2% this difference in opinion may be because the respondents with a higher level of education were more exposed to various ICT technologies and were able to see the numerous economic opportunities that lie therein as compared to their counterparts.

A majority of the respondents which represents 42.9% who had a diploma and below were of the opinion that encouraging them (diploma respondents) to undertake higher education in ICT programs would be able to open more economic opportunities that would empower them this may have been brought about by them (diploma respondents) observing other women who had pursued higher education in ICT and were able to see the various benefits that lie therein e.g. ability to earn more, the ability to apply for better jobs and higher social standing in the society. With regard to the government subsidizing the cost of ICT courses respondents who had a degree and above which represents 20% appreciated the fact that the government has a role to play with regard to the education of women in ICT as compared to their counterparts who had a diploma and below which represents 14.3%.

Table 12: Measures to improve participation of women - Skills, Training and Education views

Views on measures to improve participation on Skills, Training and Education	Frequency	Percentage %
Create awareness on benefit of being informed with the ICTs	19	29.68
Trained women in ICT should train others through seminars, conferences and forums	17	26.56
Reduction costs of training ICT	9	14.06
Introduce lessons in high school to promote ICT	9	14.06
Offer equal skills/knowledge and education to both boys & girl	4	6.25
Take affirmative action while admitting women to study ICT	1	1.56

According to Table 12, 30% of the respondents were of the view that awareness should be created among women and this awareness can be through training in institutions that offer ICT related courses or through seminars, conferences, women groups and forums.

This is in line with the Ministry of Education Gender policy objective to establish mechanisms to ensure women and girls venture into technical training in ICT.

Table 13: Measures of attaining skills, knowledge and education according to Age of respondent

Opinion on attaining skills, knowledge and education	31 years and below %	31 years and above %
Create awareness on benefit of being informed with the ICTs	35	58.3
Trained women in ICT should train others free/seminars/forum	20	8.3
Reduction costs of training ICT	10	25
Introduce lessons in highschool to promote ICT	20	0
Take affirmative action while admitting women to study ICT	0	8.3
Offer equal skills/knowledge and education to both boys&girl	15	0

According to the findings in Table 13 above the respondents were in agreement that awareness needs to be created on the benefits of ICT's, however it is important to note that the respondents who were 31 years and above which represents 58.3% strongly agreed to the idea as compared to their counterparts which represents 35% this difference in opinion is brought about by the fact that the older respondents did not grow up in a generation where these technologies were readily available or were not exposed to these technologies earlier in life.

The respondents were also in agreement that women trained in ICT should train other women. However it is important to note that the respondents who were below 31 years agreed with this opinion more which represents 20% as compared to their counterparts

which represents 8.3% this is an indicator that the younger generation particularly women need a mentor in the ICT arena also someone whom they can look up to and identify with.

The respondents who were 31 years and below which represents 20% were in agreement that lessons in high school to promote ICT should be introduced whereas their older counterparts did not respond these may be because the older generation cannot relate with the idea of ICT lessons in high school.

In this era of gender equality the respondents who were below 31 years which represents 15% were in agreement that equal opportunities of attaining skills and knowledge in ICT should be availed to both boys and girls as compared to the older respondents who are 31 years and above who never responded. This opinion may have been informed by the recent numerous calls by gender lobby groups for equality through the media.

Table 14: Measures of attaining skills, knowledge and education according to Academic Qualifications of respondent

Opinion on attaining skills, knowledge and education according to Academic Qualifications	Diploma and below %	Bachelors and above %
Create awareness on benefit of being informed with the ICTs	45.5	44
Trained women in ICT should train others free/seminars/forum	18.2	16
Reduction costs of training ICT	27.2	12
Introduce lessons in highschool to promote ICT	0	16
Take affirmative action while admitting women to study ICT	0	8
Offer equal skills/knowledge and education to both boys&girl	9.1	4

From Table 14 the respondents were in agreement that creating awareness on the benefits of ICTs was important which represents 45.5% of diploma respondents and 44% of degree holders. The diploma and certificate respondents which represents 27.2% were in agreement that reducing costs of training in ICT would encourage more women to pursue further education in ICT. This may be because the diploma respondents are well aware of the financial costs and therefore reduction of training costs would be a welcome idea. The respondents who are graduates and above which represents 16% were aware of the benefits of introducing basic ICT lessons in high school because this would form the bedrock of their future pursuits in the ICT arena.

Table 15: Measures to improve participation of women - Socio-political views according to Academic Qualification

Socio-Political views according to Academic Qualifications	Diploma and below %	Bachelors and above%
Have equal chances between men and women	72.72	78.94
Women support/encourage fellow women to be involved in ICTs	27.27	26.31
Seminars and conferences to brighten and enlighten women	36.36	57.89
Introduce ICT subjects in girls schools	18.18	0

From Table 15 the respondents both diploma which represents 72.72% and graduates which represents 78.94% were in agreement that equal chances need to be given to men and women. With regard to participation in seminars and conferences the respondents were in agreement however the degree holders which represents 57% were more enthusiastic about seminars and conferences this is because they were more exposed to

the benefits that come with attending conferences and seminars this is because it will be used as a platform for networking among women to improve their participation.

The respondents who were diploma holders which represents 18% were of the opinion that introducing ICT subjects in girls school is important this is because going by their experience it would have been easier for them to understand ICT studies if they were introduced to them earlier this is because maybe the respondents found the studies challenging initially.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter describes the summary of the research the conclusions that were drawn from the findings and recommendations for further research.

5.2 Summary

The overall objective of this study was to investigate the challenges that affect effective participation of women in accessing and using information communication technologies and finally to suggest ways or measures of improving the participation of women in information communication technologies. Women face considerably more challenges with regard to accessing and using Information communication technologies in areas of socio-cultural and institutional barriers, gender segregation in employment, pornography, trafficking and sexual violence through the internet, illiteracy, access to education and information and financial resources.

Unless explicit measures are taken to address these divides, there is a risk that information communication technologies will increase gender disparities and that the impact of information communication technology will not be maximized (Gender and Development Group, World Bank 2002). There are several arguments that can be made for promoting and encouraging women's equitable participation in information communication technology these are enabling women as active agents, contributing to economic development and mobilizing women for national competitiveness.

A majority of respondents were degree holders followed by diploma, certificate holders a distant third and Masters fourth. The findings showed that a majority of the respondents were of the age of 21-30 years. This could indicate that the respondents in this age group have a higher likelihood to be exposed to information communication technologies. In the recent past since the 1980's there has been an explosion in information communication technology area that might explain why a majority of the respondents fall under this age bracket because they may have gone or are still going to school during this period.

In the Economic dimension a majority of the respondents were in agreement that information communication technologies have created economic opportunities for women which represents 86.3% according to Figure 2. However, the respondents were in agreement particularly those who were above 31 years in Table 10 that reducing costs in ICT training and giving loans, grants and sponsorship would encourage them to further education in ICT programs thereby translating to knowledge which will increase their earning capacity or open up opportunities for them to venture into ICT as an income generating activity.

The respondents had different views on attainment of skills, knowledge, and education with regard to information communication technologies. A fair representation of the respondents indicated that existing social cultural norms have so far restricted women from accessing education in the ICT field this represents 58.9% according to Table 6. The respondents indicated that women would be encouraged more in ICT education and

training if the content was relevant which represents 87.7% according to Table 6. A majority of the respondents indicated women have gender biased attitudes against studying or attaining skills in ICT this represents 70.6% these could be due to socio-cultural factors they also added that illiteracy, technophobia and a general lack of interest because they cannot relate with these technologies or may ask of what use are these technologies to me this findings are in Table 6. However the respondents who were above 31 years felt that enough is not being done with regard to creating awareness on the benefits of ICTs according to Table 13 and this may be an indicator why they may have the gender biased attitudes towards ICT.

In the Socio- political dimension the findings indicate that there is a fair rate of participation of women in ICT which represents 52.9% according to Table 7. A majority of the respondents indicated that ICT can be used as a tool for socio-political empowerment to bridge the gender socio-political digital divide. However there were concerns which were raised these were that a majority of the respondents indicated that gender and ICT lobby groups are not doing enough to sensitize civil society groups, women's organizations and the public on critical ICT policy issues with regard to women this represents and there is under representation of women in ICT decision making levels. In summary ICT can be used as a tool for socio-political empowerment however according to Table 7 the respondents felt that gender and ICT lobby groups are not doing enough.

5.3 Conclusion

The findings showed that a majority of the respondents were of the age of 21-30 years. This could indicate that the respondents in this age group have a higher likelihood to be exposed to information communication technologies. Women tend to be ‘late adopters’ meaning that they often tend to take longer to adopt to and utilize new technology than men especially as they advance in years. These may be linked to the perception that fields such engineering and computer sciences are considered part of the ‘male domain’ in many societies this can explain the small number in the respondents as they advance in years.

Leading from the findings and in response to the research question: To what extent has ICT created new economic opportunities for women? A majority of the respondents were in agreement that ICTs have created economic opportunities for women. Women’s entrepreneurship has become recognized as an important source of untapped economic growth-bringing not only job creation but also providing different solutions to management, organization and business problems. Women’s lack of economic empowerment, on the other hand, not only imperils growth and poverty reduction, but also brings a host of other negative impacts for example less favorable education.

The respondents were in agreement that ICT can be used as a tool for socio-political empowerment to bridge the gender socio-political digital divide. This corresponds well with the commitment to mainstream gender and the effort to make fundamental changes in opportunity and empowerment as well as the attainment of at least 30 percent

representation in recruitment, promotion and appointment of women towards the Kenya Vision 2030. This is in response to research question number two: How can ICTs be used as a tool for socio-political empowerment among women.

In ICT education and training a majority of the respondents were of the view if the content was relevant to the women and if it was developed in an appropriate language used by women they would be more responsive. To promote gender balance in access to ICT education and training, reduce negative reporting and portrayal of women and girls, and address under representation of women at all levels of ICT, especially in decision making.

5.4 Recommendations

On the basis of the findings from this study, and the conclusions drawn, the following recommendations are made which would improve the participation of women in using and accessing information communication technologies:

Women and particularly girls need to be exposed to technically oriented subjects which will lead them to technical programmes in various fields of science and technology. Poor training in maths and science subjects at primary level and the lack of exposure to technically oriented subjects in their formative years, limit their performance in these subjects at secondary school and their access to technical programmes at the tertiary level.

In the Economic dimension more women should be encouraged to venture into entrepreneurial activities and this will be through accessibility of technology through promoting universal access, reduce costs of training in ICT and giving loans/grants/sponsor for ICT programs for women.

In acquiring skills and knowledge through education and training the following recommendations are suggested create awareness on benefits of ICTs, Trained women in ICT should train others through seminars and/or forum, Reduction costs of training ICT, Introduce lessons in high school to promote ICT and take affirmative action while admitting women to study ICT. Content that is relevant to women should be developed in an appropriate language used by women through this women would be more responsive

In the Socio-Political dimension the following recommendations are suggested there should be equal chances between men and women, women support and encourage fellow women to be involved in ICTs, seminars and conferences to enlighten women.

5.5 Areas for further research

From the findings the following are suggestions for further research:

Knowledge and information are essential ingredients for empowerment and therefore further research should be carried out to find out what relevant content of information and knowledge would be available through the internet from a gender perspective. When we talk about relevant content we mean issue driven content that would impact the lives of

women. An Example of issue driven content would be the reproductive health on women and how the women can empower themselves economically and socially.

The participation of women in decision making is a critical element in ensuring gender sensitive approaches and outcomes. Further research should be carried out to find what the civil society groups, women's groups and gender and ICT lobby groups are doing with regard to sensitizing policy makers, private sector and other civil society groups, including women's organizations on critical ICT policy issues with regard to women.

One of the more pervasive but intractable problems is "technophobia", the fear of technology. Women and girls often have complex relationships with technology and as a result of being socialized over time to believe that machines and technology are a man's domain and not for women and girls, thus generating a gender bias in attitudes towards studying or using information technology. Further research should be carried out to find out what measures can be put in place or what can be done to remove the social factors that produce these gender differences and what ways can we assist the younger girls who are still in their formative years in education to take up science oriented or technically oriented subjects that are a preserve of the boys or considered the male domain in many societies.

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APPENDIX 1:

PROPOSED LETTER OF INTRODUCTION

Dear Sir/Madam,

REQUEST FOR RESEARCH DATA

I am a post graduate student at the Jomo Kenyatta University of Agriculture and Technology, School of Human Resource, pursuing a Master of Science in ICT Policy and Regulation. As part of fulfillment of this program, I am conducting a research on the factors that hinder women from using and accessing information and communication technologies particularly a perspective of women in universities. You have been selected as part of the study and I humbly wish to request you to assist in providing the information in the attached questionnaire. The study seeks to establish the factors that hinder women from using and accessing information communication technologies.

The information you give is purely for academic interest and will therefore be treated with utmost confidentiality.

Your assistance and co-operation will be highly appreciated.

Yours sincerely,

Ributhi Leah Nyokabi

MSc ICT Policy and Regulation Student (researcher), JKUAT

**QUESTIONNAIRE TO COLLECT DATA TO FIND OUT THE CHALLENGES
THAT WOMEN FACE IN USING AND ACCESSING INFORMATION
COMMUNICATION TECHNOLOGIES**

RESEARCH TITLE: A study of the challenges women face in using and accessing information communication technologies.

PURPOSE: The feedback received from this questionnaire will be useful in gauging the challenges that women encounter in accessing and using information communication technologies.

The researcher is a post graduate student at the Jomo Kenyatta University of Agriculture and Technology, School of Human Resource, pursuing a Master of Science in ICT Policy and Regulation. The researcher will therefore appreciate your feedback on the above subject. Please give your honest opinion as freely and objectively as possible.

The information you give will be treated with confidentiality and will only be used for the purpose of this study.

SECTION A

Preliminary Details

Kindly please tick () the box that matches your answer to the questions and list the answers in the spaces provided as appropriate.

1. Qualifications (Professional or Academic)

- a) Doctorate level []
- b) Masters level []
- c) Undergraduate level []
- d) Diploma level []
- e) Certificate level []
- f) Other

2. Age.....

Economic Dimensions

1. Do you think ICT has created new economic opportunities for women?

- a. I think so []
- b. I don't think so []
- c. Not sure []

2. To what extent has ICT created new economic opportunities for women?

- a. Largely []
- b. Minimal []
- c. Not at all []

3. Do you agree or disagree that the cost of accessing and using ICT is too high for women in comparison to the men.

- a. Yes []
- b. No []
- c. Not sure []

4."Disparities in the cost of accessing and using ICTs between men and women can be reduced by economically empowering women" To what extent do you agree with this statement.

- a. Strongly agree []
- b. Agree []
- c. Disagree []
- d. Strongly disagree []

5. In what ways can women be part of ICT economic opportunities?

.....

.....

.....

.....

SECTION B

Attaining Skills, knowledge, capabilities and education

1. “The existing socio-cultural norms have so far restricted girls and women access to education, training and employment in ICT” To what extent do you agree with this statement

- a. Strongly agree []
- b. Agree []
- c. Neutral []
- d. Disagree []
- e. Strongly disagree []

2. “Women can be encouraged to take more part in ICT education and training if content relevant material to women was produced”. To what extent do you agree with this statement

- a. Strongly agree []
- b. Agree []
- c. Neutral []
- d. Disagree []
- e. Strongly disagree []

3. “Promoting Universal Access of these ICT technologies would encourage more women in education and training” To what extent do you agree with this statement

- a. Strongly agree []
- b. Agree []
- c. Neutral []
- d. Disagree []
- e. Strongly disagree []

4. “Women have gender biased attitudes against studying or attaining skills in information technology” To what extent do you agree with this statement

- a. Strongly Agree []
- b. Agree []
- c. Disagree []
- d. Strongly disagree []

5. "Illiteracy is a contributing factor that hinders women from participating in the benefits of information communication technologies". To what extent do you agree with this statement.

- a. Strongly agree []
- b. Agree []
- c. Disagree []
- d. Strongly disagree []

6. "Technophobia (fear of interacting with or using technologies) is a contributing factor that hinders women from participating in the benefits of information communication technologies" To what extent do you agree with this statement

- a. Strongly agree []
- b. Agree []
- c. Disagree []
- d. Strongly disagree []

7. "Lack of interest in ICT technologies among women is a contributing factor that hinders women from participating in the benefits of information communication technologies" To what extent do agree with this statement

- a. Strongly agree []
- b. Agree []
- c. Disagree []
- d. Strongly disagree []

10. (a) Have you ever encouraged a woman friend to take up an information technology course?

- Yes []
- No []

(b) If Yes what was the response? If No justify your answer

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

11. Please indicate how long you have been in the information communication technology (ICT) sector.

Between 1-6 months [] Between 6-12 months [] Between 12-18 months []
Between 18-24 months [] Over 24 months []

SECTION C

Socio-Political Dimension

1. How would you rate the participation of women in ICT.
 - a. Very Good []
 - b. Good []
 - c. Fair []
 - d. Poor []
 - e. Very poor []

2. “Gender and ICT lobby groups are not doing enough to sensitize policy makers , private sector and other civil society groups including women’s organization to the important and critical ICT policy issues with regard to women”. To what extent do agree with this statement.
 - a. Strongly agree []
 - b. Agree []
 - c. Neutral []
 - d. Disagree []
 - e. Strongly disagree []

3. “Lack of access to relevant networks in the public domain explains the historical marginalization of women’s contribution to technological innovation”. To what extent do you agree with this statement.
 - a. Strongly agree []
 - b. Agree []
 - c. Neutral []
 - d. Disagree []
 - e. Strongly disagree []

4. “Given the potential of Information communication technologies in development and social transformation, ICTs can be used as a tool for socio-political empowerment to bridge the gender socio-political divide”. To what extent do you agree with this statement.

- a. Strongly agree []
- b. Agree []
- c. Neutral []
- d. Disagree []
- e. Strongly disagree []

5. “There is under representation of women in information communications technology decision making levels including policy and regulatory institutions, boards and senior management positions”. To what extent do agree with this statement

- a. Strongly agree []
- b. Agree []
- c. Neutral []
- d. Disagree []
- e. Strongly disagree []

SECTION D

Proposed Measures to overcome Economic challenges, Challenges in Attaining skills, knowledge and education and Socio-Political challenges

<u>Economic Measures:</u>	Strongly Agree	Agree	Disagree	Strongly Disagree
1. Promoting Universal Access will reduce cost of technologies.				
2.The government should subsidize costs of ICT technologies e.g IT hardware, software				
3.Encourage Private-Public Partnerships between the government, donors and corporate sponsorships				
<u>Attaining Skills, knowledge and education</u>				
1. Encourage girls to take up science subjects when still in school.				
2.Develop content relevant to women				
3. Reduction of training and education costs in training institutions this will encourage more women o take up courses				
<u>Socio-Political Measures</u>				
1. Increase the number of women in decision making levels in information communications technology sector.				
2. Women in the ICT sector mentoring girls through mentorship programs e.g Junior Achievement Mentorship programs.				
3.The government to organize forums, conferences, seminars and workshops where women can be enlightened on the benefits of ICT.				

Please write down in your own opinion a few measures you think can be used to deal with the Economic challenges, Challenges of attaining skills, knowledge and education and Socio-Political challenges.

<u>Economic Measures:</u>
1.
2.
3.
<u>Attaining Skills, knowledge and education</u>
1.
2.
3.
<u>Socio-Political Measures</u>
1.
2.
3.