FACTORS INFLUENCING COMPUTER USAGE BY PRIMARY SCHOOL

TEACHERS ENROLLED IN DISTANCE EDUCATION PROGRAMMES

IN KENYA: A CASE OF KIENI EAST DISTRICT, NYERI COUNTY,

KENYA

BY

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DECLARATION

This is my original work and has not been presented for any academic award in any other University

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DEDICATION

First I give thanks to God for giving me life and love to embark on this project. I dedicate this work to my family: my husband John Mwangi, my children Esther, Ambrose, Jonah, Peter and Caroline for their prayers, inspiration, unwavering support, patience and understanding towards the writing of this project.

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LIST OF ABBREVIATIONS AND ACRONYMS

ALN: Asynchronous Learning Networks

CMC: Computer Mediated communication

CD: Computer Disc

DE: Distance Education

DEP: Distance Education Programme

DL: Distance Learning

DT: Distance Teaching

E-Learning: Electronic Learning

ICT: Information and Communication Technology

OLE: On-line Education

PST   Primary School Teacher

SPSS: Statistical Package for Social Sciences

TAM: Technology Acceptance Model

USA: United States of America

UTAUT: Unified theory of acceptance and use of technology

WWW: World Wide Web

ABSTRACT

The study aimed at establishing factors influencing computer usage by primary school teachers enrolled in distance education programme. The study was guided by the following objectives: to establish home computer availability among primary school teachers who have enrolled for distance, to determine internet accessibility among primary school teachers who have enrolled for distance education, to assess the competence of computer usage among primary school teachers who have enrolled for distance and to establish whether there are gender differences in computer usage among primary school teachers who have enrolled for distance. This study used descriptive survey design. The target population are the primary school teachers in Kieni East District who have enrolled in distance education programmes. The study used purposive sampling to obtain the respondents. This study used questionnaire as the tool of data collection. Descriptive and inferential statistics were used for data analysis. Research findings were presented using tables. Regarding home computer availability, it was found out that substantial number of distance learners have computers at home. However, there are more males with home computers than females. In relation to access to internet, it was found that most distance learners have access to internet. For those who can access internet, it is beneficial in their distance learning since they can access a variety of content. However, there are more male distance learners with access to internet than female distance learners. In relation to computer competence, it was found that most distance learners have taken a course in computers. However, most of them rate their competence in computers as average and low. In addition, male distance learners have a higher tendency to use computers and are more interested in computers and this makes them more competent than their counterpart female distance learners. In connection to gender differences in computer competence, it was found that male distance learners are more competent in computers than their female counterparts because they are more interested and like using computers more hence improve on their competence. The study found a significant relationship between computer competence and computer usage and between gender differences and computer usage among distance learners. The researcher recommended that distance educators should show the importance of computers to the distance learners. Female distance learners should increase their interest and time in computer usage to improve competence. The researcher suggested that a similar study should be carried out in other areas in the country to establish whether the findings are similar to those generated by the study and further research should carried out to establish how to overcome the gender differences in computer usage among distance learners in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Distance education has evolved from print-based correspondence courses to interactive web-based courses over time. Recently, the development of Internet technologies such as the World Wide Web and online communication tools has had an important impact on distance education course (Venkatesh, Morris & Davis, 2003). These technologies help educators to create interactive web-based courses which integrate text, graphics and audio-video materials that can enhance teaching and learning interactivities and also enable learners to continue their education in a more flexible and convenient way. Distance education could be the panacea of access to equal opportunities for all citizens of a country irrespective of gender, location, race or tribe (Gakuo, 2006). The popularity of this type of distance education format encourage many educational institutions to make decisions about the future of web-based learning at their institution in regard to increasing the number of web-based courses and replacing some traditional courses with web-based courses.

The potential for Information and Communication Technology (ICT), to support Open and Distance Learning (ODL) and sustain students learning programmes is immense. E-Learning is an example of use of ICT supported teaching and learning processes (Keiyoro ;P.N.2010).

A number of researchers including (ding et al 2002); Shamath et al (2004), and Romeo assert that the use of Information and Communication Technology in teaching /learning can help students become knowledgeable. It also serves as an immense opportunity for students who have special learning needs (Keiyoro;P.N.2010).The use of ICT in the

classroom is essential in providing students with a chance to learn how to operate in information age.

This situation is verified by recent institutional survey researches showing that the number of online courses and programs has increased drastically in the recent years (Agrusti & Mileva, 2007). Also, it is verified that students learn as effectively when they are attending online courses as compared to when they learn in a traditional face-to-face courses. According to Yelland (2001), traditional classrooms do not offer learners suitable learning environments necessary for preparing them to be productive in the workplaces of today's society. She states that institutions that do not use new technologies in teaching /learning cannot claim to prepare their learners for life in the 21st century. This is supported by (Grimus 2000),who argues that the use of ICT in school-based teaching and learning help the learners get prepared to engage in future developments based in proper understanding. According to Bradford(2000),current theories on learning provide an important baseline for the use of ICT to enable students and teachers develop the competencies needed for the 21st century and to enhance students academic achievements and teaching methods.

Acquisition of ICT skills plays a pivotal role in learning /teaching processes. Technology can also play a big part in supporting face –to- face teaching /learning in the classroom environment.(Wong et al 2008).These new technologies can help teachers enhance their pedagogical practice and consequently assist students in their learning process (Keiyoro 2010). According to Grabe and Grabe (2007), the process of acquiring knowledge is facilitated by the use of ICT which enable students to gain skills and motivation. Students who are proficient in ICT skills are also able to search for information, present

data and complete many learning tasks (Keiyoro 2010).Distance education environments can be thought to be more democratic than traditional approaches regarding breaking down barriers to higher education for many groups in spite of not solving all their problems. It has been recommended as a good option for especially female students trying to balance multiple roles and demands on their personal life. In view of the fact that distance education allows female having heavy family responsibilities, financial stresses and other works to both stay at home and study (Reed & Taylor, 2006). In order to link learners to resources, it is important that they are taught how to use electronic networks.

Distance Education requires the use of technology to bridge the gap between learner and the teacher and computer skills are important in this (Gikonyo ,N. 2012).The role of Distance Education in educational institutions has taken on new and radical dimensions due to Globalization and convergence of technologies into what is referred to as Information Communication Technology (ICT); and as Bill Gates says; "We are living in a truly fascinating time of change and promise". (Gikonyo N. 2012); and therefore Distance Education should be embraced as a priority mode of curriculum delivery .Thus adoption of Distance Education in institutions of higher learning will ensure that the demand for higher education is met through alternative methods .Distance Education broadens access to education (Gakuo,2006).Distance Education offers platforms which offer access to educational opportunities by removing such barriers as age ,family ,work commitments, time and institutional barriers .Kenya's Ministry of Education upholds that ICT is an important tool for education also a crucial medium for curriculum delivery (Minister's speech, 2006). This is in tandem with the policies outlined in the Constitution of Kenya,2010 and Vision,2030; which emphasises focus on expanding access, quality and equity in education.

According to Saba (2003); one of the distinguishing features of Distance Education that makes it different from other forms of education is the learner. Thus it can be concluded that, the learner is the pedestal on which Distance Education is designed.

Distance Learning as a mode of instruction should begin with a clear understanding of the learners and their educational needs. In Distance Education, online instruction involves teaching/ learning with the World Wide Web (WWW) as the principal means of content delivery and lecturer student interaction; (Gikonyo ,N. 2012).Students do not learn in a traditional face-to-face learning but in cyberspace where the classroom is the learning network which comprises a personal computer, a modem, a telephone line, a satellite dish or a radio link. According to (Harasim,et,al;1997),when students dial into the network, they turn their computer screen into a window on the world of learning.

Digital competence is a symbol of scientific and technological advance in society. According to Bishop,1992; it is the hope and challenge of an industrial and communication –based and communication – controlled society. As such, in this digital age, computer competence is vital in most of the careers. Pursuit of higher education leads to greater innovation and production of better quality goods /services as the world has become a global village.

As a result, it could be said that males and females might be different in several ways while attending in distance education courses due to their dissimilar responsibilities in their life. Researchers stated that people are not naturally sharply divided into two categories, but, in the literature they agreed that there is a need for more research on

gender debate about differences and similarities from learning strategies to computer usage and performance (Burke, 2001). This type of study can be constructive for both distance education course designers and instructors to make rational decisions regarding how to facilitate distance education instruction and how to minimize gender related differences in distance environments.

For many years, computers and Internet have been male-dominated technology. According to Gakuo; (2006) it is evident that barriers to accessing higher learning opportunities are being reduced globally because of improved learning technologies. On the other hand, recent studies showed that access to technology and computer literacy level among female and male students is no longer as a big problem as it was before (Goode, 2010). In addition, the gender gap in Internet and computer use has narrowed over the past several years and now greater numbers of female than men have come online. In the literature, gender based differences in education have been recognized as an important focus for research for a long time, especially, since increasing number of online female students (Goode, 2010). When reviewing gender related studies, the effects of this variable are inconclusive on student experience in distance education. Actually, numbers of studies showed that male and female students experience the online environment differently with respect to several ways, such as, performances, motivations, perceptions, study habits and communication behaviours. On the other hand, several results suggested that gender effects are insignificant (Enoch & Soker, 2006).

Hayes and Flannery (2002) analyzed male and female college students experience in online environment. Significant differences were found between the way male and female students who identified the strengths and weaknesses of the online environment regarding

flexibility, face-to-face interaction, shy and quiet students, self-discipline, and self motivation. Burke (2001) investigated gender differences in factors that contribute to success in online education and these include the areas of organization and the use of study materials, use of computers, confidence about studies and independent versus collaborative studies. He concluded that men and women study differently. He also discovered that women have a negative attitude towards technology, claiming that it is a man's world. Another study by Finnegan (2005) found that online female students are confident independent learners who are academically engaged and may outperform their male counterparts online. Females place greater value on the personal aspect of tutoring and have different interaction styles compared with men. Similarly, Kramarae (2003) stated that younger male students' exam scores and younger female students' exam scores were significantly different from each other. Benoit and Holbert (2008) noted that there are gender differences in styles of participation and contribution in computer mediated communication and they found that women posted and read more messages than their male counterparts on the course bulletin board.

In Africa, Keengwe, Onchwari and Onchwari (2009) suggested that some situational barriers are higher for females than males in the online environment. More females than males commented about a lack of time (female students posted 66.7% of all messages concerned about time). The online environment has been established for and currently targets working professionals. As a result, most of the students have full-time jobs. In contrast to male students, many female students indicated they were also responsible for and/or primary caretakers of children and homes. Findings suggest that the situational barrier of time is a greater concern for female online students than it is for males. In addition, to more concerns about time, female students voiced more concerns than males

over cost of tuition, books, software required for courses (i.e., statistical packages) and connecting to the Internet for research. Studies have indicated these situational barriers have been greater for females than males in online environments.

In Kenya, the government has taken measures to close up the gender gap in education (Muganda, 2002). Distance education has helped many women who had not benefited from education due to cultural, social and economic factors. However, even with the introduction of distance education, many women have the perception that technology is for men. This makes them to continue applying traditional mode in distance education. Instead of using technology to communicate with their lecturers, distance education students still incur transport costs as they insist on meeting their lecturers physically. This implies that there are many distance learners in Kenya who have not yet understood how distance education operates. Most of the studies on gender and distance education have concentrated on enrolment, wastage and completion rates. This implies that there is a research gap regarding the gender differences with respect to the usage, skill and knowledge of computer-mediated communication among distance learners.

1.1.1 History of distance education

The last few decades have witnessed rapid expansion of higher education institutions in Kenya. This can be attributed to increased demand for higher education, partly as a result of increased awareness of the positive benefits of education (Juma, 2001). Education, learning and acquisition of knowledge and skills have never been of more central importance than they are today. It is becoming increasingly clear that our ability to cope with rapid changes will become the primary measure of success at both macro and micro levels. This increased demand has seen distance education fast becoming an accepted and indispensable part of the mainstream educational platforms in both developed and developing countries, with particular emphasis in the latter (UNESCO, 2002).

The first Kenyan Government policy to address distance education in higher education was the Act of Parliament of 1966, which established the Board of Adult Education. Since independence, however, a number of commissions and reports have highlighted distance education as an alternative mode of education provision. The latest government initiative, as contained in Sessional Paper No. 1 of 2005 (Republic of Kenya, 2005), recommends the establishment of an open university and the use of Distance education in human resource development at all levels. The practice of distance education in the country has been at all levels of education and has been provided by different institutions each governed by their own institutional policies (Juma, 2003).

Kenya adopted a National ICT Policy in January 2006 (Pityana, 2009). This policy aims at ensuring the availability of accessible, efficient, reliable, and affordable ICT services. The relevant objective in this section on information technology states that government will encourage the use of ICT in schools, colleges, universities, and other educational

institutions in the country so as to improve the quality of teaching and learning. According to Macintyre and Macdonald (2011) the related strategies are to promote the development of e-learning resources; facilitate public-private partnerships to mobilize resources in order to support e-learning initiatives; promote the development of an integrated e-learning curriculum to support ICT in education; and promote distance education and virtual institutions, particularly in higher education and training, among others. Equally, the Kenya Education Sector Support Program (KESSP), developed in 2005 by the Ministry of Education, prioritizes mainstreaming ICTs into the teaching and learning process.

These efforts notwithstanding, there are a large number of qualified Kenyans who cannot secure places in the existing internal faculties of the national universities. The need for an educated workforce and the opportunity to maximize the use of limited educational resources, both human and material, call for alternative and innovative methods of learning, which can make university education available beyond lecture halls in Kenya, not limited to a particular time, pace, or space. There is also the need to incorporate ICT in education to improve access to quality education and respond to the challenges of globalization.

According to Juma (2003) several factors have led to an increasing interest in distance learning. Family commitments, especially among women, are one such factor. Women, especially in the developing countries, must deal with various constraints compared to men in terms of time and resources. The advent of distance education, however, has widened the opportunities for women and has helped to make education and training more accessible to them as they can now study within their homes. It allows them to

study at an individual pace and seek and acquire skills for individual development while, at the same time, fulfilling family responsibilities. Technological, cultural and social upheavals have impacted upon us with regularity, radically changing the way we live, work, and learn (Wheeler, 2000). Accelerating change has often overtaken even the most stable of our social institutions, including education, and the rate of change will no doubt increase in the years ahead.

Additionally, there is a growing need for continued skills upgrading and retraining, and technological advances have made it possible to teach more and more subjects at a distance. The new technologies have served to push knowledge acquisition into the domain of the individual. Concomitant with individualization comes the growing autonomy of learners. Technology, and particularly its application in flexible distance education situations, can be considered vital for increasing and widening access to learning and autonomy for the learner (Laurillard, 1993). The flexibility of open, distance, and e-learning methodologies is the key factor in their emergence as the primary mode for lifelong learning (UNESCO, 2003).

1.1.2 ICT in distance education

A key element of the government's 2006 National Information and communication Technology Policy is the use of ICT in schools, colleges, university and other educational institutions in Kenya to improve quality of teaching and learning. In 2006, the Ministry of Education introduced the National ICT strategy for Education and Training.

According to a World Bank Institute survey, the state of ICT infrastructure in African universities can be summed up as "too little, too expensive, and poorly managed (Garrison, 2011). The survey report goes on to say that the average African university has bandwidth capacity equivalent to a broadband residential connection available in Europe, and pays 50 times more for their bandwidth than their educational counterparts in the rest of the world.

Another study carried out for the African Virtual University (AVU) found that while most of the partner institutions either have an ICT policy in place or are developing one, they lack the resources to implement it (Orr, 2010). This situation may be changing however. For example Kenya has already developed national research and education networks, and several others are in the process of doing so. According to Gakuo (2009),the integration of ICT in teaching/learning varies from curriculum to curriculum, place to place and class to class. The goal of the Kenya Education Network (KENET) is to establish sustainable communication and networking among educational institutions in Kenya that will facilitate wide use of Internet technology in teaching, research, and sharing of other information resources to the general populace at affordable cost. This initiative is spearheaded by Kenya's institutions of higher learning to establish a high-speed, reliable, and sustainable network for the interconnectivity of all learning institutions.

1.2 Statement of the problem

Students are attracted to distance education for a wide variety of reasons. Distance education provides some students with access to courses when they would not have been able to otherwise participate. Some of the other reasons for taking courses at a distance include restricted learner availability during scheduled course hours; more convenience in obtaining a degree or certificate; and greater means to advance one's knowledge in one's own areas of interest, whether or not a degree or certificate is involved in use and importance (Groff & Mouza, 2008). However, most distance learners still shun technology and prefer print media. Discrepancies in both use and skills are very clear-cut among distance learners (Keengwe, Onchwari & Onchwari, 2009). In Kenya, there are few studies on computer usage among distance learners (Muganda, 2002). This may be attributed to the fact that distance education has not been in operation for long in the country. This study therefore sought to fill the knowledge gap by establishing the factors influencing computer usage by primary school teachers enrolled in distance education programmes in Kenya, more so in Kieni East district.

1.3 Purpose of the study

The purpose of this study was to establish the factors influencing computer usage by primary school teachers enrolled in distance education programmes in Kenya: a case of Kieni East District

1.4 Objectives of the study

The study was guided by the following objectives:

i.   To establish the extent to which computer availability at home influences computer usage by primary school teachers in distance education programmes in Kieni East District

ii. To determine the extent to which internet accessibility influences computer usage by primary school teachers in distance education programmes in Kieni East District

iii. To assess the extent to which computer competence influences computer usage by primary school teachers in distance in Kieni East District

iv. To establish the extent to which gender difference influences computer usage among primary school teachers in distance education programmes in Kieni East District

1.5 Research questions

The study attempted to answer the following research questions

i.   To what extent does computer availability at home influence computer usage by primary school teachers in distance education programmes in Kieni East District?

ii. To what extent does internet accessibility influence computer usage by primary school teachers in distance education programmes in Kieni East District

iii. To what extent does computer competence influence computer usage by primary school teachers in distance in Kieni East District?

iv. To what extent does gender difference influence computer usage among primary school teachers in distance education programmes in Kieni East District.

1.6 Hypothesis for the study

i. H_1: There is a significant relationship between computer availability at home and computer usage by primary school teachers in distance education programmes in Kieni East District

H_0: There is no significant relationship between computer availability at home and computer usage by primary school teachers in distance education programmes in Kieni East District

ii. H_1: There is a significant relationship between internet accessibility and computer usage by primary school teachers in distance education programmes in Kieni East District

H_0: There is no significant relationship between internet accessibility and computer usage by primary school teachers in distance education programmes in Kieni East District

iii. H_1: There is a significant relationship between computer competence and computer usage by primary school teachers in distance in Kieni East District?

H_0: There is no significant relationship between computer competence and computer usage by primary school teachers in distance in Kieni East District?

iv. H_1: There is a significant relationship between gender and computer usage among primary school teachers in distance education programmes in Kieni East District

H_0: There is no significant relationship between gender and computer usage among primary school teachers in distance education programmes in Kieni East District.

1.7 Significance of the study

The study investigated computer usage.

The main contribution of this study was to gain an understanding regarding technology use among distance learners and this might assist distance educators or administrators in providing effective learning environment for distance learners. Distance learners might realise the need to have computers at home to make distance education easier. They might as well realise the need to be computer literate and competent since distance education requires the use of technology. Distance educators and learners might learn the effect of technology on performance and as a result, necessary measures may be taken to ensure that distance learners are conversant with technology. As a result, performance would be improved and distance education would achieve its objectives in a better way. The teachers could benefit by improving their competence in their studies and also in teaching and testing techniques and in developing better teaching and learning materials. The findings of this study might shed some light to interested researchers in future.

1.8 Scope of the Study

The study was delimited to the public primary schools in Kieni East District. This is due to its accessibility and the fact that it has the characteristics the researcher wished to study. It was also delimited to the primary school teachers who have enrolled for distance education. This implies that the results of the study should be applied in other areas with caution.

1.9 Basic assumptions of the Study

The study assumed that the data given by the respondent would be correct and accurate for the study. The study also assumed that the sample would fully represent the population. It also assumed that the tools for data collection would be appropriate and adequate to collect the data

1.10 Definition of significant terms used in the study

Competence of computer usage   means having the skills to use computers

Distance education   is a field of education that focuses on teaching methods and technology with the aim of delivering teaching, often on an individual basis, to students who are not physically present in a traditional educational setting such as a classroom

Gender differences   mean the disparities between male and female students in terms of computer usage, interest, competence and attitudes towards computers

Home computer availability   refers to learners having computers at the comfort of their homes

Internet accessibility   refers to having the right to use internet

Performance   means accomplishment in academic work and getting good grades

Technology   refers to machinery and equipment developed from such scientific knowledge

1.11 Organization of the study

This study was organized in five chapters. The first chapter (introduction) covered background to the study, problem statement, objectives, research questions, significance, limitations, scope, assumptions and definition of significant terms. The second chapter reviewed the past literature regarding this topic. It also had a theoretical and a conceptual framework as well as summary of the chapter. The third chapter (research methodology) had the research design, target population, data collection instruments and methods of analysing and representing data. Chapter four was composed of data analysis, interpretation and presentation. Chapter five was composed of summary, discussion, conclusion, recommendations and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covered past literature on computer usage among distance learners and the factors influencing it focusing on the home computer availability, internet accessibility, competence in computer usage and gender differences. It covered theoretical framework, conceptual framework and a summary of literature review.

2.2 Evolution of Distance Learning

Distance learning started as early as the first century AD when St. Paul used his letters or epistles to the young churches around the Mediterranean. This was a powerful form of distance learning as can be judged by the substantial growth of the Christian Church. St. Paul's epistles are, because they continue to be read today, among the most successful applications of distance learning in history. The next phase in the history of ODL started with the age of printing and posting. An Englishman, Isaac Pitman, is credited as an early pioneer. He began teaching shorthand by correspondence in Bath, England in 1840. Students were instructed to copy short passages of the Bible and return them for grading via the ―new post system.

In the United States of America (USA), several activities in adult education preceded the organization of ODL. In 1873, Anna Ticknor started the society to encourage studies at home for the purpose of providing educational opportunities for women, which provided correspondence instruction to 10,000 members over a 24-year period. American University level ODL began in 1874 at Connecticut, Wesleyan University where bachelors and graduate degrees could be obtained in absentia. One of the first universities

to deliver distance learning in an organized manner was Pennsylvania State University, which established its first distance learning network in 1886 using the US mail to communicate with its distributed students. Subsequently, a number of universities in the United States of America embraced distance learning as a mode of delivery. The first US Open University was New York State's Empire State College, which commenced operations in 1971.

The establishment of the British Open University in the United Kingdom in the year 1969, marked the beginning of the use of technology through well-designed courses. According to Harry, Keegan and Magnus (1993), the British Open University which is acknowledged as the most innovative university in the world has played a major role in the development of much of the important research in distance learning. The success of the British Open University was the major reason for the development of open universities in other countries such as USA, Japan, India, China and Turkey. Today, China is the world leader in ODL not only by the volume of its activity, but also its diversity with over two million students, in the Open University of China alone.

The past 100 years have seen phenomenal growth in avenues of information development and dissemination. The earliest form of distance education simply involved people reading what scholars had written on a variety of topics, and was almost exclusively the preserve of the upper classes, who could afford both the time away from survival-oriented tasks, and the cost of individually hand-crafted manuscripts. According to Sherry (1994), Gutenberg's invention of the printing press was perhaps the earliest example of technology revolutionizing distance education. The written word could now be mass-produced with relative efficiency. Coupled with the emergence of international postal

services, correspondence courses began to appear through the latter half of the nineteenth century and up to the middle of the twentieth century. A much larger segment of society had access to the thoughts and ideas of their fellow men (as opposed to women, who have remained marginalized throughout much of recorded history).

The next great advance was radio. In the space of a few decades, programmes and materials were available which greatly reduced the barrier of distance. Much more revolutionary was the advent of instructional television. Technology seemed to have provided a mechanism to duplicate the classroom setting, in a medium, which could be sent right into the learner's home. But both of these technologies had significant drawbacks. First, they were one-way mediums of communication. The learner remained essentially enrolled in a correspondence course, but with some useful supplemental materials. Second, the broadcasts were only available 'live' (Sherry, 1994). With the development of phonographs, audio and videotapes, and xerographic equipment, all of these course materials could be duplicated with relative ease. Production costs declined, more varied course schedules could be accommodated, and review of materials became common. In addition, with the widespread availability of telephone communications in some parts of the world, distance learners and educators finally began to be able to provide fairly rapid feedback and communication (Douglas, 1993).

The development of microwave and satellite technologies greatly expanded radio and television coverage. Signals could be broadcast further, to more locations, at reduced cost compared to terrestrial systems. In the past few years, as the cost of reception equipment declined, and the variety of programmes available increased, there has been a significant increase in television-based distance education courses. But this remained a one-way

means of communication. Critics complained that distance education programmes were merely a passive transmission of academic information (Cartwright, 1994).

The big change needed was interaction starting with two-way communication between the learner and the instructor. Joan Fulton put forth five fundamentals of an effective programme as: contact between the student and the instructor, active learning through writing out answers, timely feedback to the instructor on students' comprehension, timely feedback to students on work done, opportunity for students to make revisions to work done and learn from their mistakes (Fulton, 1992). Four of these require timely bi-directional communication. Communicating by mail was increasingly unsatisfactory. Telephone and conference calls helped a great deal, but remained awkward and expensive. It is also not feasible for the instructor to communicate with every learner in this manner. Fax machines took up some of the burden, especially easing administrative tasks. As computer networks expand, electronic mail is beginning to take hold as the principal alternative for communication between learners and instructors, and among learners themselves. This is a rapid and inexpensive method of communication, and it is flexible enough to accommodate both individual and group communication (DeLoughry, 1994).

One of the biggest movements currently is the provision and expansion of two-way video communication, whether through satellites or communication networks. Most of these are an expansion from the one-many to include the many-one paradigm. The instructor can see the students, and the students can see and respond to the instructor. This sort of 'full presence' system is becoming the minimum standard required for such distance education programmes (Fugel, 1995). The past few years have even brought technologies such as

auto-tracking cameras, zoom lenses, and other devices which permit the instructor to move around during the class (Shields, 1995). Satellites continue to be the favoured medium, but as coaxial and fibre-optic cables spread to more locations, this is starting to change. Fibre, especially, has the capacity to handle multi-directional full-motion video (Douglas, 1993). A contributing factor recently has been the sharp rise in satellite costs. The problem is here now, but the cable system alternatives have been installed in only limited areas. Institutions are also finding it increasingly difficult to maintain awareness of the changing technological fields, and to make long-term purchasing decisions (Day, 1994). As an example, many providers have failed to update their satellite technology and find themselves unable to incorporate new advances from signal compression to analogue-to-digital conversion. The need for the latter is increasingly apparent, as new technologies evolving with the computer age permit the encoding and transmission of a variety of data formats through everything from telephone lines to satellite links (DeLoughry, 1995).

One probable future direction would be the leasing of cable services from local service suppliers such as telephone or cable television corporations. This would reduce the burden on the institution for making market decisions, and for handling maintenance and upgrades. It would also position them more effectively for the emerging global electronic information environment.

2.3 Distance Learning in Africa

Prior to the emergence of distance learning providers in Africa, many African students obtained various qualifications through distance learning providers in Europe and North America. One of the oldest distance education universities that emerged in the African continent is the University of South Africa (UNISA), which has been offering correspondence courses since 1946. UNISA's success has, as a result, spurred the establishment of other ODL providers in the African continent. Examples of these are the open universities in Nigeria, Tanzania and Zimbabwe, which started out as providers of residential programmes and have now diversified into providing ODL as well (Juma, 2003).

It is significant to note that some organizations are providing assistance to African countries in mainstreaming of ODL into their educational systems. Major among these are: the Commonwealth of Learning (COL) which is helping governments and institutions to use techniques of distance learning in the achievement of the Millennium Development Goals (MDGs). It is also assisting in the area of capacity building. It should also be recognized that the African Council for Distance Education (ACDE) that was established in the year 2005 with its headquarters in Kenya, is expected to play a significant role in the development of ODL in Africa. The number of virtual online universities has been growing and would continue to grow over the next few years. If this approach to educational development is used judiciously, it would open up new frontiers to learning by enriching collaborative research among African universities and between universities in Africa and other parts of the world. It would also promote cross-national, multi-disciplinary perspectives in educational practice, and thereby equip students, teaching staff, and administrators with tools and resources that would enable them to

successfully engage the academic world of the 21st century. Distance learning techniques are increasingly being employed by a growing number of higher education institutions in Africa. While most of the on-going distance education initiatives on the continent have been used to upgrade the quality of basic education (Association for the Development of Education in Africa, 1999), some countries are taking bold initiatives in piloting Internet-based and satellite-linked distance educational programmes in selected courses. The University of Abidjan and the African Virtual University are good examples. While a number of African universities have established distance education departments, the delivery platform to date has been text and correspondence- based, supported by print material. Some of the institutions are beginning to explore the use of the Internet, video conferencing, and other forms of multimedia (Association for the Development of Education in Africa, 1999). For example, the Telesun programme in Cameroon uses Internet-based courses in its science programme. The OHDET programme links Benin and three other countries with McGill University in Canada. The RIDL programme in Djibouti provides teacher training from French universities (Association for the Development of Education in Africa, 1999).

Currently, four institutions in South Africa provide distance education courses: Technikon South Africa, Technical College of South Africa, Vista University, and the University of South Africa (UNISA), the oldest mega-university. Its distance education programme to off-campus students was started in 1946, with an enrolment of over 130,000 in 1995 (Wiechers, 1995). This represents over one-third of all university enrolments in South Africa. These schools enrol over 225,000 students annually (Butcher, 1998).

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The most ambitious distance education initiative on the continent to date is the African Virtual University (AVU) Project. This is the first satellite-based attempt to harness the power of information technologies to deliver university education in the disciplines of science and engineering, non-credit/continuing education programmes, and remedial instruction to students in Sub-Saharan Africa. According to Darkwa and Mazibuko (2000), it represents the essential instruments for sharing resources at affordable prices to large numbers of people. The AVU project would deliver instructional programmes, strengthen the capacity in African partner institutions, implement a network infrastructure, and implement a digital library programme (Darkwa and Mazibuko 2000). About five Anglophone and five Francophone African countries are participating in the initial pilot phase. The project would be extended to other African countries during the third and final phase.

2.4 Open and Distance Learning in Kenya

The first government policy to address distance higher education was the Act of Parliament of 1966, which established the Board of Adult Education. The Kamunge Report of 1988, expressed satisfaction that the External Degree Programme offered by the University of Nairobi as an example of a successful Alternative and Continuing Education Programme that could be nationally accessed by eligible learners throughout the country. It also recommended that facilities for printing and recording of educational materials at the College of Adult and Distance Education be updated and expanded to cope with the growing demand for adult education through distance teaching (Republic of Kenya, 1988). The initiation of the Faculty of Distance Education in the 1960s was majorly due to the fact that the need for high level manpower was greatest felt due to responsibilities created soon after independence. The first recommendation for the establishment of the first degree by external studies, University of Nairobi was made in the Kenya Education Commission Report (Republic of Kenya, 1985). With the continued demand for university education, the increasing number of candidates who meet the requirements and the inability of the internal departments, the government through the University of Nairobi sought to look into the possibility of setting up external degree studies programme.

This was followed by appointment of a task force committee on 21st June, 1983 by the University of Nairobi deans committee. The task force submitted a report in August the same year which provided details on the structure, courses to be offered, medium of instruction and support services, and financial requirements and the administration of the programme. The objectives of the external degree programme were to provide: learning opportunities for the qualified Kenyans who cannot secure places in the existing internal

faculties of the national universities; an alternative and innovative method of learning which is not limited to a particular time and space. An opportunity for people to learn at their own pace; the much needed high level manpower; and an opportunity to maximize the use of limited educational resources both human and material by making university education available beyond lecture halls in Kenya.

The Mungai Report of 1995 on its part recommended that the establishment of an open university similar to the ones operating in Britain, Hong Kong and Tanzania be considered as a way of extending university education to as many Kenyans as possible. The report, however, cautioned against basing the Open University on the current restrictive system practised in the public universities. It was of the view that it should be based on innovative strategies aimed at meeting the needs of as many Kenyans as possible that desire university education. The public universities were asked to establish short courses for purposes of skills improvement and a source of generating income (Juma, 2003). The Koech Report (1999) hailed the external degree programme of the University of Nairobi as being particularly beneficial to serving teachers and other Kenyans in employment that would otherwise not have been able to enrol for university education on a full time basis. It recommended that the programmes be expanded in order to reach many deserving and qualified Kenyans. It also hailed parallel degree programmes that have helped individuals who had otherwise been barred from public university admission (Republic of Kenya, 1999).

Despite these recommendations by the important policy documents, distance education programmes remain tiny components of higher education and government involvement is quite minimal. Among the various distance education degree programmes currently being

implemented by most of the Kenyan public universities, the External Bachelor of Education Degree Programme offered by the University of Nairobi was designed and implemented to meet the needs of distance learning (Juma, 2003). The course, which is under the auspices of the College of Adult and Distance Education, Faculty of External Degree Studies, was launched in the mid-1980s with financial support from the British Council. As expected the development, production and dissemination of distance learning materials requires adequate resources if the full potential of the various media used is to be realized (Juma, 2003). The preparation of good quality, self-instructional materials for distance learners can be difficult and at times, time consuming, if they have to be pedagogically sound. The course programmes and students materials for this particular programme, however, seem to have been so successful that the college of Adult and Distance Education has had to reprint them for use in a number of distance education programmes in the Eastern and Southern African region.

According to Juma, 2003, the Bachelor of Education distance degree programme was designed to last 6 years and was open to the then A' level candidates with particular preference to teachers and teacher trainers who held a teaching diploma and the teaching certificate holders. At the beginning the programme admitted around 600 students of whom close to 450 students were able to graduate, which considerably was quite successful considering the high attrition rate in some distance learning programmes. The programme is divided into three levels with each level having two semesters of six months. Printed material, each covering unit content equivalent to forty-five one-hour lectures is provided. A minimum of 70 hours is needed by the student to study each unit. Support services include face-to-face teaching, audiocassettes; library services other teaching/learning materials, which include identified key textbooks in each unit. Face to

face teaching and learning include residential sessions for orientation, tutoring and counselling at the study centres (Juma, 2003).This traditional face-to face education is increasingly becoming inadequate to cater for higher education needs(Vision 2030).This calls for more innovative ways of educating those who need higher education(G.Naomi,2012). The College of Adult and Distance Education decided to use its provincial extra-mural centres as study centres. They currently provide facilities for learning and for individual and group tutoring and academic guidance and counselling. They also serve the basic function for information provision.

In addition, Kenya had 2 African Virtual University sites located in Kenyatta and Egerton Universities. The African Virtual University (AVU) started in 1997 with the pilot phase. During the pilot phase AVU sites received courses transmitted via satellites such as introduction to programming, introduction to engineering, computer organization and architecture, introduction to Internet, among others transmitted via satellite from universities in Canada, Europe and the United States of America (Juma, 2001). This was set up to increase access to tertiary and continuing education in Africa by reaching a large number of students and professionals in multiple sites simultaneously; improve the quality of education by tapping the best African and global academic resources, and by offering training and coaching to academics in African universities to prepare teaching materials for delivery through the AVU network; and contribute to bridging the digital divide by improving connectivity in AVU learning centres and host universities and by providing training in engineering, computer science, information technology and business (Juma, 2001). Their objective has however changed from providing training directly to students through their sites to providing the much needed training of staff in open and distance education.

2.5 Factors influencing computer usage by primary school teachers in D.E.P

There are many factors which could be influencing computer usage among distance learners. However, for the purpose of this study, four factors will be considered; home computer availability, internet accessibility, competence and gender differences in computer usage.

2.6 The influence of computer availability at home on computer usage by primary school teachers

Having a computer is a sign of technology acceptance among distance learners. However, studies regarding the gender which uses computers at home most among distance learners have varied findings. According to a study by Zhou and Xu (2007) the American Demographics women are about equally likely to use home computers for educational purposes, and have been forecast as a major target market for CMC-based higher education. Although distance education may extend access to learning opportunities for adults who otherwise might not be served it cannot be assumed the CMC-based distance education provides an equitable learning environment when traditional higher education has been well-documented to have inequitable characteristics for female students.

Zhang (2005) study presents the results of a survey implemented to investigate Turkish university students' technology use profile and their thoughts about distance education. The results of this study show that 38% of the students have home computer with an Internet connection, and 64%, 53%, and 30% of the students connect to the Internet for communication, newsgroups, and web searches, respectively. 72% of the respondents who said that they have computers at home were male. In addition, the findings show that

the students prefer to access the Internet from either Internet cafes or their homes. Blended learning is the most favourite learning environment among these students.

Krentler and Willis-Flurry (2005) explored the level of availability of computers, Internet accessibility and the rate of usage of computers both at home and at the work place between distance education learners according to gender. The results revealed that there are no significant differences in all three aspects. The findings indicate that female distance education learners participate equally with their male counterparts in the utilization of computer technology to assist their study requirements as well as in their involvement in information and communication technology (ICT)

Looker and Thiessen (2008) study to compare learning behaviours in an online science learning environment in school vs. at home based on gender reflects similar learning behaviours for boys and girls. However, they concluded that there were more boys than girls having home computers.

Another study was done in the University of Botswana by Adeyinka and Mutula (2008) to determine gender differences amongst undergraduates' students across all disciplines with regard to computer literacy. Five hundred students were surveyed of which 300 were females while 200 were male. The results suggest that gender differences exist between female and male undergraduate students at the University of Botswana with regard to computer literacy. The findings further revealed that students with higher computer literacy were more inclined to access and make use of library facilities as well as have computers at home. Moreover, differences exist in the respondents' computer usage and software application.

2.7 The influence of internet access on computer usage by primary school teachers

Computer usage has been studied in pre-university, university and work environments. While the findings show differences and variations in male and female use and attitudes to technology use, the gap seems to be narrowing, but remains persistent, even as the profile seems to be changing. From an educational policy perspective, although the gap seems to be less of an issue, males and females appear to use educational technology differently and more the internet (Enoch & Soker, 2006). On the other hand, there does seem to be some consensus regarding the fact that men and women are different in terms of their frequency of use, duration and content when accessing the Internet. For example, males had significantly higher positive perceptions of the use of a digital library and although Internet use among males and females had increased, males were more likely to use web-based instruction in an open university (Enoch & Soker, 2006) and they reported more computer experience and had higher perceptions of their competence.

Agrusti and Keegan 2007) conducted a study to investigate the gender differences with respect to the internet accessibility among Malaysia distance education learners. The findings revealed that there were no significant differences between genders in terms of Internet accessibility and rate of computer usage of less than three times a week and the type of computer applications used. No gender differences were also found in terms of the level of competency of the usage of common computer software as well as the networking software that were directly related to learning activities in distance education.

Gurol (2010) noted that the use of internet is becoming widespread among distance learners all over the world. Internet has been increasing its importance for individuals for purposes of searching for learning materials and communicating. The study revealed that 14.8% of the students use internet for 2 hours or more in a week and 72.9% of students do not use internet in weekdays at all. The findings also showed that 76.1% of the students knew the concept of 'internet' for more than four years, and 61.9% of the students accessed to internet from the internet cafes, 48.4% of the students used internet for academic purposes and 63.9% of the students wanted to set up their web pages on the internet. In the light of research findings, internet-based and interactive lesson applications are inevitable education tools for education in the future. According to the findings, female students seemed to log into internet less but stayed connected more and students mostly preferred to use internet cafes for internet access. In these cafes, internet was used mainly for academic purposes. This implies that distance learners make effort to access internet and use it for distance education.

Ono and Zavodny (2009) also examined whether there are differences in men's and women's use of the Internet and whether any such gender gaps have changed in recent years. Women were significantly less likely than men to use the Internet at all in the mid-1990s, but this is changing. However, once online, women remain less frequent and less intense users of the Internet. The study concluded that there is little reason for concern about sex inequalities in Internet access and usage now, but gender differences in frequency and intensity of Internet usage remain.

2.8 The influence of computer competence on computer usage by primary school teachers

Since the beginning of computerization, it has been of interest whether there are differential effects on computer behaviour, in particular in terms of computer access, computer use, and motivational variables, such as computer self-efficacy (Steele, 2008). The current research addresses the questions if the gender-related differences in this respect persist to the present day and if there is also a difference in actual performance characteristics. A sample of 48 university students (23 male) was administered a technology self-efficacy questionnaire, a survey on computer access, recorded a user diary, and turned in a computer task. Results show that the gender gap is closing as far as computer access and self-efficacy are concerned. Also, female and male students report comparable amounts of computer usage for their studies. User behaviour appears to be gender-specific as males spend more time at the computer for personal purposes. There is also some evidence that male students outperform female students at a computer task (re-mastering of Power-Point slides).

Colley and Comber (2003) analysed the Australian students' use of Information and Communication Technology (ICT). They described their ability in using a wide range of computer applications. Secondary data was used in this study where there were 12, 551 students from 321 schools across Australia involved in the survey. The data was descriptively analyzed using SPSS software to identify and compare students' ICT use and ability. The findings revealed that the majority of students were competent in using ICT both for the context of their school learning and individual use. It was also evident in

the data that more male students used this technology on a frequent basis compared to female students.

Davis and Davis (2007) studied on the gender differences in self-perceived computer competencies among distance education learners in Malaysia. Four aspects of competencies that are related to computer usage and its applications were studied; these were competencies in the usage of general computer software, usage of networking software, handling of computer hardware and performing computer maintenance. The results showed that there are no significant differences between the genders in terms of the competencies in the usage of general computer software as well as networking software. These are directly linked to the educational purposes needed to support and facilitate learning in distance education. However, gender differences are observed regarding competencies in their handling of most aspects of computer hardware as well as performing computer maintenance.

Benoit and Holbert (2008) in addition to gender differences in computer access and confidence, research in Europe and USA has highlighted differences in girls' and boys' preferences concerning computer use and learning style. The overall conclusion on computer use is that whereas boys tend to like technology for its own sake and enjoy playing games or tinkering with computers for fun - girls tend to want to know what information technology can do and use computers as tools to accomplish certain purposes. However, boys were noted to have higher competence in computer use than girls more so when dealing with computer applications and hardware.

Past studies in relation to competence in computer usage are not consistent. Steele (2008) and Colley and Comber (2003) claimed that there are differences between male and females distance learners in relation to computer competence while Davis and Davis (2007) and Benoit and Holbert (2008) claim that there is no differences. However, the four studies were in agreement that when it comes to computer applications and maintenance, men are better.

2.9 The influence of gender differences on computer usage by primary school teachers

Because gender bias pervades societies throughout the world, we can expect to find gender bias in relation to computer usage among distance learners. For example twelfth-grade girls in Canada and in China showed a decline in computer attitudes when compared to eighth-grade girls (Collis & Williams, 2007). A study of college students showed no gender difference by age of student, but this may have been due to the short age span involved (Koohang, 2006). Another study found gender differences in age which were due more to computer experience than to age (Dyck & Smither, 2004). On the whole; however, effect sizes in studies on age were larger for older students than for younger ones. Whitley, in a review of 82 studies, concluded that gender differences in attitudes toward computers result from socialization processes: the longer that children are in school, the greater the gender difference becomes" (Whitley, 2005). He noted, however, that such differences were smaller for college-level students and speculated that perhaps young women with more positive computer attitudes were more likely to go to college.

An overwhelming majority of studies have found that boys have greater computer experience than girls, and in many countries: the United States, Australia, Norway, Canada, England, Scotland, Israel, Iran, and in multi-country studies. Boys have an edge in home computer use, school computer use, computer course-taking, games, and in free-time exploratory use. Of these, games and free-time exploratory use are most frequently cited as the primary causes of boys' greater computer experience. Computer course-

taking in high school in the U.S. was roughly equal until 1994; however, the latest data show that it is more unequal now, favouring boys, than at any time since such data were collected in 1982 (Snyder, Tan & Hoffman, 2004).

A few studies, however, have not found greater male computer experience. In 2002 Liu and colleagues found that girls had more prior computer experience than boys. (Liu, Min & Phillips, 2002) Other studies found negligible or no differences in experience. (Freeman, 2004; Whitley, 2005) Robin Kay, in a review of 38 studies, found that males had more experience in 30 studies, females in four, and no difference in four (Kay, 1992). In the United States, student computer use (as opposed to course-taking) is now for the most part equal (Snyder, Tan & Hoffman, 2004), with the following exceptions: use of the Internet for educational purposes is equal until college, at which point females use it more than males; non-Internet computer use for school purposes is equal until college, at which point males use it more. A recent study in Scotland found that college women were less likely to own a computer than their male counterparts (Gunn, 2003).

Beyond overall experience patterns, several studies have had particularly interesting, although inconsistent, results. When first-year college students were randomly assigned to a writing course with required or optional (optional meaning computers and instruction were readily available) computer use, females' computer use levels by the end of the course were higher in the computer-required condition than for females in the optional condition or for males in either condition, suggesting that requiring the use of computers may be beneficial (Arch & Cummins, 2009). A large number of children in grades 4 to 10 were surveyed annually for three years. The more experienced the students became with computers, the less confidence they had in their computer skills, and this was particularly

true for girls. The authors conclude that experience alone will not close the computer gender gap (Krendl, Broihier & Fleetwood, 2007). In most studies dealing with experience and attitudes, greater experience tended to result in improved attitudes. When children ages 10 to 15 were surveyed about their computer experience, girls indicated about the same number of hours per week as boys when they completed the questionnaire in same-sex groups but significantly less time when in mixed-sex groups. (Cooper & Stone, 1996)

With some exceptions, many studies and in many countries find that boys have more positive feelings about the computer than girls — boys tend to like computers more and are more interested in them. Again with some exceptions, many studies find that the level of computer experience correlates with liking and interest. Typically, studies find that computer liking and interest decrease with age for both girls and boys but more strongly for girls. (Gurer & Camp, 2008; Lage, 2003; Shashaani, 2003; Whitley, 2005) Krendl found that while girls' attitudes decrease with age, their sense of computers' value and usefulness increases (Krendl, Broihier & Fleetwood, 2007). In a 1999 meta-analysis of 106 studies, Liao found that males had slightly more positive computer attitudes (Liao, 2009), while another study established that girls' and boys' computer attitudes were equal when the factors of experience and gender stereotyping were removed (Colley, Gale & Harris, 2004). Computer attitudes were seen to correlate with math attitudes (Shashaani, 2003) and were affected by socio-economic status in a study linking lower-SES girls with high computer liking. Margolis and her colleagues have explored computer interest in several studies, finally concluding that in the "nexus of confidence and interest" (Margolis, Fisher & Miller, 2000), a female's loss of confidence in her computer abilities precedes a drop in her interest in computers. In many studies boys invariably saw

computers and computer skills as male-associated; females differed, seeing them as male or neutral or, in a few cases, female.

Cotten and Telenewicz (2006) noted that motivational factors may underlie differences in spatial experience namely computer experience. It is likely that men and women commonly use computers for different tasks and internet differently with computer software and video games which may foster different skills acquisition and maintenance.

2.10 Theoretical framework

This study was guided by Unified theory of acceptance and use of technology (UTAUT). Unified theory of acceptance and use of technology (UTAUT) is a technology acceptance distance education formulated by Venkatesh and others in user acceptance of information technology: toward a unified view. The UTAUT aims to explain user intentions to use an information system and subsequent usage behaviour **(**Bagozzi, 2007). The theory holds that four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of usage intention and behaviour. Gender, age, experience, and voluntariness of use are posited to mediate the impact of the four key constructs on usage intention and behaviour.

The theory was developed through a review and consolidation of the constructs of eight distance educations that earlier research had employed to explain information systems usage behaviour (theory of reasoned action, technology acceptance distance education, motivational distance education, theory of planned behaviour, a combined theory of planned behaviour/technology acceptance distance education, distance education of personal computer use, diffusion of innovations theory, and social cognitive theory) (Venkatesh, Morris and Davis, 2003). Subsequent action of UTAUT in a longitudinal study found it to account for an impressive 70% of the variance in BI and about 50% in actual use **(**Bagozzi, 2007).

UTAUT is the best distance education to predict individual's technology acceptance because it can explain 70% of dependent variable variance comparing with TAM only 40%. In UTAUT, performance expectancy is similar to TAM's perceived usefulness, and is defined as the degree to which an individual believes that using the system will help

him or her to attain gains in job performance **(**Bagozzi, 2007). Like perceived ease of use in TAM, effort expectancy refers to "the degree of ease associated with the use of the system". Social influence is the degree to which an individual perceived that important others believe he or she should us the new system. Social influence refers to the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

UTAUT introduced 4 moderators. There are gender, age, experience, and voluntariness of use. These factors can help to explain the behaviour differentiation on different relationships. For example, the effect of performance expectancy on behaviour intention is moderated by gender, age, and experience. The effect of effort expectancy on behaviour intention is moderated by gender, age, and experiences. The effect of social influence on behaviour intention is moderated by all 4 variables while the effect of facilitating conditions on use behaviour is moderated by age and experience, 2 variables only. Performance expectancy, attitude toward using technology, facilitating conditions, self-efficacy, and social influence have significant influence on behaviour intention. Additionally, only behaviour intentions, attitude toward using technology, and social influence have direct impact on system usage (Venkatesh, Morris and Davis (2003).

This theory was used to explain why some people may choose to accept technology and use it while other are not interested. In most countries for example, men are expected to perform better in regard to technology than women. This may make women disregard technology claiming that it is a man's field. The society might influence people to believe the same. On the same note, most people are of the opinion that studying technology is difficult and much effort would be required to achieve the same. Consequently, people

may not be willing to put in this extra effort to study or use technology. The situation is worse if there are no facilitating conditions like availability of gadgets. These factors would influence people in one way or another. For example, a person may have no compute usage competence because it requires too much effort to acquire. As a result, such a person may not have a computer at home or have access to internet because after all they have no skills to use them.

2.11 Conceptual framework

The conceptual framework is the schematic diagram which shows the variables included in the study. Its main purpose is to clarify concepts and propose relationships among the concepts in a study. Figure 1 shows conceptualization table on the factors influencing computer usage by primary school teachers enrolled in distance education programmes in Kenya. The dependent variable is computer usage by primary school teachers while the independent variables include computer availability at home, internet accessibility, computer usage competence and gender differences and the moderating variable is government policy.

Independent variables   Dependent variable

```
┌─────────────────────────────┐
│ Computer availability at home│
│ - Laptop                     │
│ - Desktop                    │──────┐
│ - Tablet                     │      │
│ - Smart phone                │      │
└─────────────────────────────┘      │
                                      ▼
┌─────────────────────────────┐      ┌──────────────────────────┐
│ Internet accessibility       │      │ Computer usage by primary│
│ - Wireless                   │─────▶│ school teachers in D.E   │
│ - Fiber network              │      │ - Programmes             │
│ - Modem                      │      │ - Frequency              │
└─────────────────────────────┘      │ - Purpose                │
                                      └──────────────────────────┘
┌─────────────────────────────┐            ▲
│ Computer usage competence    │            │
│ - Teaching/ learning         │────────────┤
│ - Social activities          │            │
│ - Information                │            │
└─────────────────────────────┘            │
                                            │
┌─────────────────────────────┐            │
│ Gender differences           │            │
│ - Gender type                │────────────┤
│ - Relation between gender and│            │
│ computer usage               │            │
└─────────────────────────────┘            │
                                  Moderating variable
                              ┌──────────────────────────┐
                              │ Government policy         │
                              └──────────────────────────┘
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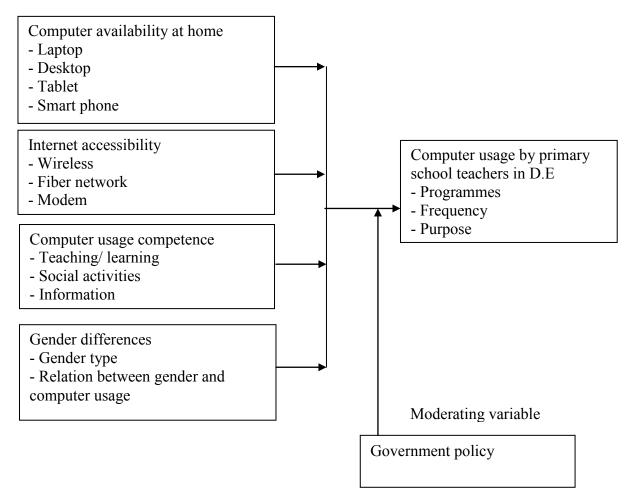
Figure 1: Conceptual framework

2.12 Summary and research gaps

This study focused on four factors: home computer availability and usage, internet accessibility, competence in computer usage and performance of distance learners based on technology. There were varied opinions on the literature studied.

Regarding gender differences and home computer availability, different researchers had different opinions. Some found no difference between the genders (Zhou and Xu, 2007; Krentler and Willis-Flurry, 2005). Others found more male students with home computers than the female students (Zhang, 2005; Looker and Thiessen, 2008 and Adeyinka and Mutula, 2008). Studies regarding internet accessibility and usage are varied with Enoch and Soker (2006), Gurol (2010) and Ono and Zavodny (2009) claiming that male distance learners internet more than female learners. However, Agrusti and Keegan (2007) found no difference between the two.

Past studies in relation to competence in computer usage were not consistent. Steele (2008) and Colley and Comber (2003) claimed that there are differences between male and females distance learners in relation to computer competence while Davis and Davis (2007) and Benoit and Holbert (2008) claimed that there is no differences. However, the four studies were in agreement that when it comes to computer applications and maintenance, men are better. Studies on gender differences in relation to computer use among distance learners showed that there is gender difference in relation to computer ownership, interest and liking as well as computer skills. This study reconciled these findings as well as established the extent to which they apply to the distance learners in Kieni East District.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter dealt with the methodology to be used in the study. It included research design, target population, sample size and sampling procedure, research instruments, validity of instrument, reliability of instruments, data collection procedures and data analysis techniques.

3.2 Research design

This study used descriptive survey research design. According to Mugenda and Mugenda (1999), descriptive research is designed to obtain information concerning the current information or phenomena and whenever possible to draw general conclusion from the facts. The design was appropriate because it produced data that is holistic, contextual, descriptive, in-depth and rich in details. This method was also appropriate for this study because it is an effective way of collecting data from a large number of sources relatively cheaply and within a short time. In addition, the design was used because the subjects were observed in a completely natural and unchanged natural environment without influencing them (Kothari, 2004).

3.3 Target population of the study

The target population refers to the group of subjects who will be investigated in relation to the problem under study, they are the sources of data intended to achieve the study's objectives. In this study the researcher targeted the primary school teachers in Kieni East District who have enrolled for distance education in the different universities in Kenya like University of Nairobi, Kenyatta University, Kenya Methodist University, Mt. Kenya University and Karatina University College. There are 52 primary schools in Kieni East District and 160 teachers who have enrolled for distance education. It is from these that the respondents were drawn.

Table 3.1 Target population

University	Population (N)
University of Nairobi	54
Kenyatta University	40
Kenya Methodist University	32
Mt. Kenya University	14
Karatina University College	8
Other universities	12

3.4 Sample Size and Sampling Procedure

The study used purposive sampling to obtain the respondents. This is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue or capacity and willingness to participate in the research. Some types of research design necessitate researchers taking a decision about the individual participants who would be most likely to contribute appropriate data, both in terms of relevance and depth. In this context, only the primary school teachers who have enrolled for distance education were selected to participate in the study.

Table 3.2 Sample size

University	Population (N)	Sample	Percentage (%)
University of Nairobi	54	27	50
Kenyatta University	40	20	50
Kenya Methodist University	32	16	50
Mt. Kenya University	14	7	50
Karatina University College	8	4	50
Other universities	12	6	50
Total	160	80	50

Out of the 160 teachers who have enrolled for distance, 80 (50%) took part in the study. As Kothari (2004) explains, 10% sample population can fully represent a target

population. However, the bigger the sample is, the better it represents the target. This is why a 50% sample was preferred (Kothari, 2004).

3.5 Research Instruments

This study used questionnaires as the tools of data collection. The questionnaires had both closed and open-ended questions. Close-ended questions were accompanied by a list of all possible alternatives from which the respondents selected the answer that best described their situation. Open ended questions gave the respondents complete freedom of response. The questionnaire was based on the objectives of the study.

3.6 Reliability of the instruments

Reliability of the research instrument is its level of internal consistency over time. A reliable instrument therefore, is the one that constantly produces the expected results when used more than once to collect data from two samples drawn from the same population. The reliability of a test is usually expressed as a correlation coefficient, which measures the relations between variables. A pilot study was conducted to measure reliability of the instrument through split-half method. The process of obtaining split-half reliability was begun by "splitting in half" all items of a test that were intended to probe the same area of knowledge in order to form two "sets" of items. The entire test was administered to a group of individuals, the total score for each "set" was computed and finally the split-half reliability was obtained by determining the correlation between the two total "set" scores. A correlation coefficient of 0.7 was obtained and this confirmed the reliability of the instruments.

3.7 Validity of the instruments

Validity is the accuracy and meaningfulness of inferences which are based on the research results. In other words, validity is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. To confirm the validity of the research instrument, the questionnaires were pre-tested before the actual research. This helped to ensure that the instruments could measure what they were intended to measure. In addition, the researcher consulted research experts and the supervisors to ensure that the items in the questionnaire measured what it was intended to measure.

3.8 Data Collection Procedure

The data collection procedure began by making an application for permit to be allowed to carry out research in Kenya from the National Council for Science and Technology. Subsequent clearance to carry out the study was obtained from the County Education Office. The researcher then paid a visit to the participating schools to inform them of the intended study and create some rapport. The researcher administered the questionnaires and picked the filled questionnaires one week later.

3.9 Data Analysis Method

The results of the questionnaire were checked for completeness as preparation for its analysis. Data was appropriately coded for ease of use with Statistical Package for Social Sciences (SPSS). Descriptive statistics, in form of frequencies and percentages were used since these allowed the researcher to present the data in a more meaningful way which allowed simpler interpretation of the data. The study used chi-square method to find the relationship between the variables

3.10 Operational Definition of Variables

The study was guided by one dependent variable: computer usage by primary school teachers and four independent variables: computer availability at home, internet accessibility, computer usage competence and gender differences as presented in Table 3.3

Table 3.3 Operationalization Table of variables

Objective	Variable	Indicators	Measure	Measurement scale	Type of analysis	Tool of analysis
To establish the influence of home computer availability on computer usage by primary school teachers who have enrolled for distance education programmes	Independent Computer availability Dependent Computer usage	Computers available - Laptops - Desktop - Tablet - Smart phone	No. Of computers available - Number of students with computers at home - Number of students who can afford but don't have computers at home	Ordinal	Descriptive	Central tendency
To determine the influence of internet accessibility on computer usage by primary school teachers who have enrolled for distance education programmes	Independent Internet accessibility Dependent Computer usage	Internet accessibility - Wireless - Fibre - Modem	No. of students who have access to internet - Number of students who have internet accessibility at home	Ordinal	Descriptive	Central tendency
To assess the influence of competence of computer usage by primary school teachers who have enrolled for distance	Independent Computer competence Dependent Computer usage	Computer competence - Teaching/ learning - Social activities - Information	No. of students with computer skills - Number of students who have studied computer usage	Ordinal	Descriptive	Central tendency
To establish the influence of gender on computer usage among primary school teachers who have enrolled for distance education programmes	Independent Gender differences Dependent Computer usage	Gender differences - Gender differences - Gender type - Relation between gender and computer usage	-Student's gender -Computer availability based on gender -Internet accessibility based on gender -Computer competence based on gender	Nominal	Descriptive	Central tendency

The dependent variable was computer usage. This was determined by the four independent variables. The first independent variable was availability of computers at home. Such computers include laptops, desktops, tablets and smart phones. The study aimed to establish the number of computers available, number of students with computers at home and number of students who can afford but don't have computers at home. This was done through ordinal measurement scale and in descriptive statistics like percentages. The second independent variable was internet accessibility. The variable focused on the means of accessing internet by distance learners such as wireless, fibre, modem as well as the number of students who have access to internet and the number of students who have internet accessibility at home. Ordinal measurement scale was used and descriptive statistics in form of percentages were used. The third independent variable was computer competence. This variable focused on computer competence in teaching/ learning, social activities and getting information. It also aimed to establish the number of students with computer skills and the number of students who have studied computer usage. These can influence computer usage. The final independent variable was gender. This variable focused on gender differences in computer usage, gender type and the relation between gender and computer usage. It also established the computer availability based on gender, internet accessibility based on gender and computer competence based on gender.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents data analysis, presentation and interpretation. Data analysis and interpretation is the process of assigning meaning to the collected information and determining the conclusions, significance and implications of the findings. The results were presented based on the objectives of the study which were aimed at establishing factors influencing computer usage among primary school teachers who have enrolled for distance education in Kieni East District, Kenya. The data was analysed using descriptive analysis with the help of Statistical Package for Social Sciences (SPSS). The data analysed is presented using frequency tables. Interpretation of the findings is given.

4.2 Response rate

A total of 80 questionnaires were sent to the respondents. The respondents were best placed to provide authentic and adequate data since they were involved directly. Out of 80 respondents all of them returned the questionnaires. The response rate was therefore 100%. According to Groves, Fowler, Couper, Lepkowski and Singer, (2009) a response should be two thirds and above. A high response rate ensures more detailed analysis and conclusions and less chance of bias. With a response rate of 100%, the study achieved these.

4.3 General characteristics of the respondents

In establishing the responses of the respondents, the researcher sought for information regarding the gender, marital status, age, teaching experience and year of study of the respondents.

4.3.1 Gender of the respondents

Gender being one of the variables, it was important to establish the gender of the respondent. Table 4.1 presents the gender of the respondents. The participants responded as shown in the table.

Table 4.1 Gender of the respondents

Response	Frequency	Percentage
Male	40	50.0
Female	40	50.0
Total	**80**	**100.0**

As shown in Table 4.1, there were 40(50%) males and 40(50%) females. This implies that both genders have enrolled for distance education programmes and they were well represented in the study.

4.3.2 Age of the respondents

Establishing the age of the respondents was important because the age of distance learners differs from the conventional college learners. The respondents were asked about their age and the findings are as summarised in Table 4.2

Table 4.2 Age of the respondents

Age	Frequency	Percentage
25 - 35 years	11	13.8
36- 45 years	46	57.5
46 - 55 years	18	22.5
56 years and above	5	6.3
Total	**80**	**100.0**

According to Table 4.2, 11(13.8%) of the respondents were aged between 25 and 35 years, 46(57.5%) were aged between 36 and 45 years, 18(22.5%) were aged between 46 and 55 years while 5(6.3%) were 56 years and above. This implies that most distance learners were above 36 years old.

4.3.3 Marital status of the respondents

It was imperative to establish the marital status of the learners because it can influence the way they learner. In relation to the same, the participants responded as shown in Table 4.3

Table 4.3 Respondents' marital status

Marital status	Frequency	Percentage
Married	59	73.8
Single	14	17.5
Others	7	8.8
Total	**80**	**100.0**

As shown in Table 4.3, 59(73.8%) of the respondents were married while 14(17.5%) were single and 7(8.8%) were in other categories. This implies that most respondents have families and this increases their responsibilities.

4.3.4 Years of teaching experience of respondents

Since the work can influence the way distance learners learn, the respondents were asked about their years of teaching experience and they responded as shown in Table 4.4

Table 4.4 Years of teaching experience of respondents

Response	Frequency	Percentage
1 - 5 years	7	8.8
5 - 10 years	15	18.8
10 - 15 years	15	18.8
15 - 20 years	24	30.0
20 - 25 years	12	15.0
25 - 30 years	7	8.8
Total	**80**	**100.0**

As shown in Table 4.4, 7(8.8%) of the respondents have taught for less than 5 years, 15(18.8%) have taught for 5 to 10 years and 10 to 15 years. Other 24(30%) respondents have taught for 20 to 25 years and 7(8.8%) have taught for 25 to 30 years. Majority of the respondents have teaching experience of more than 10 years.

4.3.5 Year of study of the respondents

The respondents were asked about the year they enrolled for distance education programme because the longer a distance learner has been in school, the higher the chances of using computer in learning. They responded as shown in Table 4.5

Table 4.5 Year of study of the respondents

Year	Frequency	Percentage
1st	24	30.0
2nd	48	60.0
3rd	8	10.0
Total	**80**	**100.0**

As indicated in Table 4.5, 24(30%) of the respondents were in their first year of study, 48(60%) were in their second year while 8(10%) were in their third year of study. This shows that all the respondents were in their first, second and third years of study.

4.4 Analysis of factors influencing computer usage by primary school teachers

This section presents the analysis of factors influencing computer usage by distance learners. These are based on the objectives of the study which were availability of computers at home, internet accessibility, computer competence of distance learners and gender.

4.5 Computer availability at home and computer usage by primary school teachers

The respondents were required to give information about computer availability at home and usage and they responded as shown in the following paragraphs.

4.5.1 Computer availability at home

The respondents were asked whether they have home computers because this can influence the rate at which they use computers. They responded as shown in Table 4.6

Table 4.6 Computer availability at home

Response	Frequency	Percentage
Yes	48	60.0
No	32	40.0
Total	**80**	**100.0**

As shown in Table 4.6, the respondents who have computer at home were 48(60%) while the ones who do not have computers at home were 32(40%). This shows that most distance learners have computers at home.

4.5.2 Respondents' major use of computer at home

It was imperative to establish the major use of the computers at home because distance learners may have computers at home but they may not necessarily use them for distance learning. The participants responded as shown in Table 4.1

Table 4.7 Respondents' major use of computer at home

Response	Frequency	Percentage
No computers at home	32	40.0
To aid in distance learning	24	30.0
Entertainment	8	10.0
For family	16	20.0
Total	**80**	**100.0**

In relation to the kind of use the distance learners put their computers to, 32(40%) said that they do not have computers at home in the first place, 24(30%) said that they have computers at home to aid in distance learning. Another 8(10%) said that the computers at home are for entertainment while 16(20%) said that the computers they have at home are for family. This shows that even if there are many distance learners with computers at home, only a negligible number use them for distance learning. The reason for a significant few (30%) using computers for distance learning could be because many distance learners have not yet adopted technology and its application in distance learning. In addition, some may buy computers but have no skills to use them in distance learning.

On being asked about the reasons for not having computers at home, the respondents gave

reasons as shown in Table 4.8

Table 4.8 Reasons for lack of computers at home

Response	Frequency	Percentage
Have computers	48	60.0
Can't afford	24	30.0
I don't know how to use it	8	10.0
Total	**80**	**100.0**

Of the 32(40%) respondents who said that they do not have computers at home, 24(30%)

said that it is because they cannot afford computers while 8(10%) said that it is because

they do not know how to use computers. This implies that the cost of computers is

impeding some distance learners from buying them. It also shows that computer illiteracy

is preventing distance learners from adopting computer technology in distance learning.

4.5.3 Frequency of computer use by primary school teachers

This item sought information on how often the respondent uses computer for distance learning because they might use the computers for distance learning too rarely such that it has no impact on distance learning. The respondents responded as shown in Table 4.9

Table 4.9 Frequency of computer use by primary school teachers

Response	Frequency	Percentage
Often	32	40.0
Moderately often	24	30.0
Rarely	24	30.0
Total	**80**	**100.0**

As shown in Table 4.9, 32(40%) of the primary school teachers said they use computers for distance learning often, 24(30%) said moderately often while 24(30%) said rarely. This implies that even if some distance learners lack computers at home, they could still be using computers for distance learning. However, the frequency of using computers for distance learning is relatively low. The findings also show that there are still distance learners who are yet to start using computers for distance learning.

4.5.4 Computer usage at home for distance learners

This item sought for information on ways in which home computer have aided respondent's distance learning and the responses are as summarised in Table 4.10

Table 4.10 Computer usage at home for distance learners

Response	Frequency	Percentage
No home computers	24	30.0
Convenience to download content	32	40.0
I don't have to rely on cyber cafes	16	20.0
Others	8	10.0
Total	**80**	**100.0**

When asked about the ways in which home computers have helped the learners in distance learning, 24(30%) said they do not have home computers, 32(40%) said that home computers create conveniences when they want to download content, 16(20%) said that they do not have to rely on cyber cafes while 8(10%) gave other reasons like they can get materials that are not available in the books or modules. This means that having computers at home been beneficial to the distance learners.

4.6 Internet accessibility and computer usage by primary school teachers

The distance learners were asked about their accessibility to internet and they gave the following responses

4.6.1 Access to internet of the respondents

It was important to establish the number of students who have access to internet because a big part of distance learning can be achieved through the internet. On being asked whether respondent has access to internet, they responded as follows

Table 4.11 Access to internet of the respondents

Response	Frequency	Percentage
Yes	60	75.0
No	20	25.0
Total	**80**	**100.0**

As shown in Table 4.11, 60(75%) of the respondents have access to internet while the other 20(25%) do not. This implies that majority of the distance learners can access internet whether it is at home, office or cyber cafes.

4.6.2 Knowledge of internet use by respondents

The respondents were asked whether they know how to use the internet because even with accessibility to internet, if they do not know how to use it, it might not help them in distance learning. They answered as shown in Table 4.12

Table 4.12 Knowledge of internet use by respondents

Response	Frequency	Percentage
Yes	64	80.0
No	16	20.0
Total	**80**	**100.0**

When asked whether they know how to use internet, 64(80%) of the respondents said yes while the other 16(20%) said no. Of the ones who said that they know how to use internet, one said that it is because he has a computer and a modem at home and another one said that they ask for help from the cyber cafes attendants. This implies that majority of the distance learners have the capability to use internet hence can access internet content via the same. However, there are still distance learners who cannot use internet and this may affect accessibility to content for learning

4.6.3 How the internet has helped the distance learner in distance education

The internet may have helped the distance learners in different ways and this item sought to establish the ways in which it has helped them. On being asked about how the internet has helped the distance learner in distance education, the participants responded as shown in Table 4.13

Table 4.13 How the internet has helped the distance learner in distance education

Response	Frequency	Percentage
No access	8	10.0
Access of a variety of content	40	50.0
Communicate through emails	16	20.0
I don't have to go the cyber cafes	16	20.0
Total	**80**	**100.0**

When asked how internet has helped the distance learners, 8(10%) said they have no access, 40(50%) said that they can access a variety of content, 16(20%) said that they can communicate through emails, while another 16(20%) said that they don't have to go the cyber cafes. This implies that internet has been helpful to the distance learners but the number of distance learners who benefit academically from internet are only half of the total.

4.7 Competence in computer use and computer usage by primary school teachers

This item sought for information regarding competence of computer usage among distance learners. The distance learners responded as shown in the following paragraphs.

4.7.1 Media used by respondents in the course of distance education

This item sought for information on the kind of media that the distance learners use in the course of learning through distance education. The participants responded as shown in Table 4.14

Table 4.14 Media used by respondents in the course of distance education

Response	Frequency	Percentage
Computers	56	70.0
Others	24	30.0
Total	**80**	**100.0**

As shown in Table 4.14, 56(70%) of the respondents indicated that they use computers in the course of their distance education studies. The others 24(30%) use printed media in the form of modules.

4.7.2 Computer knowledge by respondents

This item sought for information on the level of computer knowledge that the distance learners have attained. The respondents were asked whether they had taken a course in computer packages and they responded as shown in Table 4.15

Table 4.15 Computer knowledge by respondents

Response	Frequency	Percentage
Yes	48	60.0
No	32	40.0
Total	**80**	**100.0**

When asked whether they have taken a course in computer packages, 48(60%) said that they had taken courses in computer packages while 32(40%) said that they had not. This implies that there are many distance learners who have made effort to learn computer packages. This was prompted by the reasons as indicated in Table 4.16

Table 4.16 Reasons for taking a course in computer packages

Response	Frequency	Percentage
Not applicable	32	40.0
Requirement from parent/lecturer/employer	16	20.0
Acquire prerequisite computer knowledge	32	40.0
Total	**80**	**100.0**

As shown in Table 4.16, 32(40%) of the respondents said that they had not taken a course in computer packages, 16(20%) said that it was a requirement from parent/lecturer/employer and 32(40%) said that they needed to have basic computer knowledge in case it will be needed somewhere. This means that majority of the distance learners (60%) have not chosen to study computer packages.

4.7.3 Respondents as they rate their own computer knowledge

It was important to have the distance learners rate their own computer knowledge because this can be an indicator of the likelihood of using the same in distance learning. The participants were asked to rate their own computer knowledge and their ratings are as shown in Table 4.17

Table 4.17 Respondents as they rate their own computer knowledge

Response	Frequency	Percentage
Very high	8	10.0
High	24	30.0
Average	40	50.0
Low	8	10.0
Total	**80**	**100.0**

Out of the respondents who took part in the study, 8(10%) rated their computer knowledge very high, 24(30%) rated it as high, 40(50%) said that it is average while 8(10%) rated it low. This is an implication has majority of the respondents (60%) do not regard the computer knowledge they have highly.

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4.8 Gender differences in computer usage by primary school teachers

This item sought to get information on respondents' opinions of whether there are gender differences as far as computer usage among distance learners is concerned.

4.8.1 Gender differences and computer usage by primary school teachers

This item sought for participants' opinions on whether there are gender differences in computer usage among distance learners and the responded as shown in Table 4.18

Table 4.18 Gender differences and computer usage by primary school teachers

Response	Frequency	Percentage
Yes	48	60.0
No	32	40.0
Total	**80**	**100.0**

When asked whether there are gender differences in relation to computer usage among distance learners, 48(60%) respondents said yes while 32(40%) said no. This implies that even though majority of the respondents were of the opinion that there are gender differences in computer usage among distance learners, a substantial number of respondents think otherwise.

4.8.2 Reason behind the gender differences in computer usage in distance education

On being asked about the reasons behind the gender differences in computer usage in distance education, the participants responded as shown in Table 4.19

Table 4.19 Reason behind the gender differences in computer usage

Response	Frequency	Percentage
Not applicable	24	30.0
Interest and liking	8	10.0
Level of computer skills	8	10.0
Attitude towards technology	32	40.0
Others	8	10.0
Total	**80**	**100.0**

As shown in Table 4.19, 24(30%) of the respondents said that there are no gender differences in computer usage, 8(10%) said that there are gender differences are due to interest and liking, 8(10%) said that it is due to level of computer skills while 32(40%) gave the reason to be attitude towards technology and 8(10%) did not give any reason. This shows that even if there are not major gender differences in computer usage, male distance learners may use computers more than the female students.

4.8.3 Gender differences on availability of computer at home

This item sought for information on whether there are gender differences in relation to availability of computer at home. The participants responded as shown in Table 4.20

Table 4.20 Gender differences on availability of computer at home

Response	Frequency	Percentage
Yes	40	50.0
No	40	50.0
Total	**80**	**100.0**

Table 4.20 shows gender differences in relation to home computer availability and use and 40(50%) of the respondents reported that there are no gender differences while the other 40(50%) said that there are gender differences. The respondents who reported that there are gender differences gave the following reasons: more males have businesses alongside teaching hence can afford to buy computers; more males and interested in computers than females hence are more likely to buy computers; more males have a positive attitude towards computers hence are likely to buy; women are usually very busy attending to domestic chores hence do not see the need to buy computers which they might not use and more males have computer knowledge than females. For the ones who said that there are no gender differences in computer availability and use, they gave the following reasons: both males and females have equal access due to job demands and that it is easy to learn how to use computer irrespective of gender. These reasons bring out the gender differences in home computer availability and usage.

4.8.4 Whether there are gender differences in relation to internet accessibility

The purpose of this item was to establish whether there is a difference between the male and female distance learners in terms of internet accessibility. On being asked whether there are gender differences in relation to internet accessibility, the participants responded as shown in Table 4.21

Table 4.21 Gender differences in relation to internet accessibility

Response	Frequency	Percentage
Yes	40	50.0
No	40	50.0
Total	**80**	**100.0**

Regarding internet accessibility, 40(50%) of the respondents reported that there are no gender differences while 40(50%) said that there are gender differences. For those who said that there are gender differences in internet usage, they gave the following reasons: female distance learner's access to internet is hindered by distance to towns (where cyber cafes are located). This is because they have to take time to do domestic chores. Others said that male distance learners have the time to learn to use computers hence can access internet more easily. Women's computer skills are generally low. For those who said that there are no gender differences in internet access they said that any distance learner irrespective of gender has the ability to access internet. There are no differences because distance learners of either gender do not view internet as a leaning tool. This implies that even if not many, there are significant gender differences in relation to internet accessibility among distance learners.

4.8.5 Gender differences in relation to computer competence

It was imperative to establish whether the male and female distance learners are the same as far as computer competence is concerned. Table 4.22 shows participants' responses

Table 4.22 Gender differences in relation to computer competence

Response	Frequency	Percentage
Yes	47	58.8
No	33	41.3
Total	**80**	**100.0**

Table 4.22 shows gender differences in relation to computer competence where 47(58.8%) of the respondents reported that there are gender differences while the other 33(41.3%) reported that there are no gender differences. For the ones who reported that there are gender differences as far as computer competence is concerned said that interest, attitude, access and time affect use of computers among the two genders and therefore competence. For those that said that there are gender differences, they said that some computer applications can be difficult for any gender and many distance learners irrespective of gender do not see the need to enrol for computer course. This means that one gender maybe having high computer competence than the other.

Table 4.23 Chi-square test results for computer usage variables

Variables	Value (x^2)	df	Level of significance
Availability of computer at home	7.39	1	0.007
Internet accessibility	9.6	1	0.002
Computer competence	1.438	1	0.23
Gender differences	2.45	1	0.118

*Significant at $p>0.05$

The four independent variables: availability of computer at home, internet accessibility, computer competence and gender differences were run against computer usage by distance learners. According to the results, computer competence ($p>0.23$) as well as the gender differences ($p>0.118$) emerged as the variables that had significant relationships with computer usage by distance learners. On the other hand, the results showed no significant relationship at,($p<0.007$)between availability of computer at home and computer usage and between internet accessibility at($p<0.002$) and computer usage by distance learners.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, discussions, conclusions and recommendations of the study.

5.2 Summary of the study

The study aimed to establish gender differences with respect to the usage, skills and knowledge of computer-mediated communication among primary school teachers who have enrolled for distance education in Kenya. The study was guided by four objectives. One was to establish home computer availability among primary school teachers who have enrolled for distance, to determine internet accessibility among primary school teachers who have enrolled for distance education, to ascertain the competence of computer usage among primary school teachers who have enrolled for distance and to establish whether there are gender differences in computer usage among primary school teachers who have enrolled for distance. This study used descriptive survey design. The target population are the primary school teachers in Kieni East District who have enrolled for distance education. The study used purposive sampling to obtain the respondents. This study used questionnaire as the tool of data collection. Descriptive statistics, in form of frequencies and percentages was used for data analysis. Research findings were presented using frequency tables. Test results were presented using chi square.

5.3 Findings of the study

The primary school teachers enrolled for Distance Education and who were the target population of the study, were found to be not adequately competent on the use of ICT. Training in basic technical ICT skills was also found to be inadequate. Accessibility to good quality ICT infrastructure was also found to be pertinent for teachers enrolled for on-line distance education. Gender differences on attitudes towards computers, competence and usage of computers were also found.

5.4 Discussions of findings

Both genders were well represented in the study given that half of the respondents were male and half were female. It was also found out that most of the respondents had enrolled in distance learning between 2009 and 2011 hence can remember their experience with computer usage. It was as well discovered that the most used technology in distance education is computer with other students using print media in form of modules and handouts. This is in line with Vision 2030 which decries the inadequacy of the traditional face to face education to cater for higher educational needs. It is also supported by Gikonyo Naomi,(2012), who points out that, this calls for more innovative ways of educating those who need higher education.

On the first objective which was to establish the extent to which computer availability at home influences computer usage by primary school teachers in distance education programmes in Kieni East District, it was found out that there is a significant number of respondents with home computers. This is supported by Zhang (2005) and Krentler and

Willis-Flurry (2005) who reported that a substantial number of distance learners have computers at home compared to traditional learners. This is to ease distance learning. Nonetheless, the studies found out that more males than female distance learners are likely to have home computers. This is in line with Zhang (2005) and Looker and Thiessen (2008) and Adeyinka and Mutula (2008) studies which found out that majority of the distance learners with home computers were male. However, not all distance learners use their computer for educational purposes. Some use them for entertainment while others are for family. This shows that even if there are many distance learners with computers at home only a negligible number use them for distance learning. For those who do not have computer at home, some cannot afford while others lack because they do not know how to use them. The frequency of using computers for distance learning is relatively low. The findings also showed that there are still distance learners who are yet to start using computers for distance learning. Of those who use computers for distance learning, some reported that home computers create conveniences when they want to download content, while others said that they do not have to rely on cyber cafes while others said they can get materials that are not available in the books or modules.

On the second objective which was to determine the extent to which internet accessibility influences computer usage by primary school teachers in distance education programmes in Kieni East District, statistics showed that majority of the distance learners have access to internet. They also showed that majority of the distance learners know how to use internet. However, there are still distance learners who cannot use internet and this may affect accessibility to content for learning. When asked how internet has helped the distance learners, the respondents reported that they can access a variety of content, they can communicate through emails, while others said that they don't have to go the cyber

cafes. This implies that internet has been helpful to the distance learners but the numbers of distance learners who benefit academically from internet are only half of the total. The study also found out that more males than females is likely to use internet. The findings are in line with Gurol (2010) who found an increased use of internet among distance learners and Ono and Zavodny (2009) who found that males are more likely to use internet than female distance learners.

On the third objective which was to assess the extent to which computer competence influences computer usage by primary school teachers in distance in Kieni East District, the statistics show that majority of the distance learners have taken a course in computer packages. However, only a few distance learners have enrolled for such courses by choice. Most distance learners rated their competence in computer as average and low. This could be an implication that distance learners have not yet embraced technology, specifically computer usage wholly. Gender-wise, males are more likely to use computers hence become more competent than females. This is supported by Steele (2008); Colley and Comber (2003) and Benoit and Holbert (2008) who found increased use and interest of computers among male students and these contributed to their increased competence. Gikonyo N.(2012); also brings on board the importance of computer skills which bridges the gap between learner and the teacher in Distance Education.

On the fourth objective which was to establish the extent to which gender difference influences computer usage among primary school teachers in distance education programmes in Kieni East District, statistics show that majority of the respondents were of the opinion that gender differences exist but a substantial number of respondents reported that there are no gender differences. The gender differences arise due to interest

and liking, attitude towards technology, level of computer skills, affordability and dual responsibilities. However, the opponents of gender differences in computer competence based their opinions on the facts that job demands are the same for male and female distance learners and computer skills are easy to acquire irrespective of gender. Half of the respondents reported that there are gender differences in internet accessibility citing reasons like female distance learner's access to internet is hindered by distance to towns and male distance learners have the time to learn to use computers hence can access internet more easily. However, opponents of gender differences in internet accessibility cited reasons like distance learners of either gender do not view internet as a leaning tool. This implies that even if not many, there are significant gender differences in relation to internet accessibility among distance learners.

In relation to computer competence, most respondents were of the opinion that there were gender differences citing reasons like interest, attitude and time. For those that said that there are no gender differences, they said that some computer applications can be difficult for any gender hence no gender difference. These findings are supported by Snyder, Tan and Hoffman (2004); Arch and Cummins (2009); Gunn (2003); Cooper and Stone (1996) Liao (2009); Margolis, Fisher and Miller(2000) who reported that male students have an edge in home computer use, school computer use, computer course-taking, games and in free-time exploratory use hence increasing their competence.

However, the potential for Information and Communication Technology (ICT), to support Open and Distance Learning (ODL) and sustain students learning programmes is immense (Keiyoro P.N. 2010) .Adoption of Distance Education in institutions of higher learning will ensure that the demand for higher education is met through alternative methods (Gakuo,2006).

5.5 Conclusion of the study

Regarding the first objective on the influence of computer availability at home on computer usage by primary school teachers, it can be concluded that a substantial number of distance learners have home computers. However, there are more males with home computers than females. Some distance learners cannot afford to buy home computers while others fail to buy them because they do not know how to use them. The distance learners with home computers do not necessarily use them for educational purposes only; rather, they use them for family and entertainment. Only few distance learners use home computers for educational purposes. Even if they have computers, the frequency of using those computers is relatively low. While some distance learners have found the benefits of using home computers like creation of convenience when accessing contents, distance learners are yet to fully appreciate the fact that computers can help them in distance education.

On the second objective of influence of access to internet on computer usage by primary school teachers, it can be concluded that most distance learners have access to internet. For those who can access internet, it is beneficial in their distance learning since they can access a variety of content. However, there are more male distance learners with access to internet than female distance learners.

On the third objective on the influence of computer competence on computer usage by primary school teachers, it can be concluded that most distance learners have taken a course in computers. However, most of them rate their competence in computers as average and low. In addition, male distance learners have a higher tendency to use

computers and are more interested in computers and this makes them more competent than their counterpart female distance learners.

On the fourth objective on gender differences in computer usage, it can be concluded that male distance learners are more competent in computers than their female counterparts because they are more interested and like using computers more hence improve on their competence.

5.6. Recommendations

i) The researcher recommended that distance educators should show the need for distance learners to have computers and the benefits that would accrue to them as a result. Accessibility to good quality ICT infrastructure is pertinent for teachers enrolled for on-line distance courses.

ii) Distance learners should put effort to access and use internet because it would help them to access more information.

iii) Distance education requires adoption of technology. As a result, distance learners should improve on their computer skills in order to be in a better position to adopt technology in distance learning. Training in basic technical ICT skills should be a prerequisite to any career.

iv) Given that its information age, female distance learners should increase their interest in computer usage hence improve their competence in the same. These would not only help them in distance education but also in other aspects of life and work.

v) Women and girls should be encouraged to gain spatial experiences such as computer usage which might help to bridge the gap in spatial ability between the sexes.

vi) More marketing should be done in Kieni East District to promote the enrolment of more learners to distance education programme.

vii) Clear policy guidelines are required to guide the strategic incorporation of ICT at every level as new innovations come into the market.

viii) The distance learners should embrace computers and technology at large because this would be working towards the Millennium Development Goals and Kenya Vision 2030.

5.7 Suggestion for further research

The researcher suggested that:

a. Further research to be conducted to establish how to overcome the gender differences in computer usage among distance learners in Kenya.

b. Further research to be conducted to determine how to increase computer usage among distance learners.

c. Further research to be conducted to focus on investigating level of usage of computer programmes which are considered to be related with attitudes towards computer technologies.

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APPENDICES

Appendix 1: Introduction Letter

Dear Sir or Madam,

REF: REQUEST FOR PARTICIPATION IN RESEARCH STUDY

I am a final year Master of Education Degree student at the University of Nairobi. I am currently undertaking research study on factors influencing computer usage among primary school teachers who have enrolled for distance education in Kenya: A Case of Kieni East District, Nyeri County. You have been chosen to take part in the study.

I request you to kindly spare a few minutes and complete the enclosed questionnaire. Your identity will be treated with utmost confidentiality and the information provided will be used purely for the purpose of the study and no other reason whatsoever. Your timely response will be highly appreciated. Please do not indicate your name anywhere in this questionnaire.

 Yours faithfully,

MWANGI RUTH WANJIRU

APPENDIX II

TEACHERS' QUESTIONNAIRE

This is a questionnaire is on gender differences with respect to the usage, skills and knowledge of computer-mediated communication among primary school teachers who have enrolled for distance education in Kenya. Kindly tick (√) or answer the questions. Thank you for your time and cooperation

Demographic information

1. What is your gender?

      Male   ( )

      Female   ( )

2. What is your age bracket?

      Below 25 years   ( )

      26 – 35 years   ( )

      36 – 45 years   ( )

      46 – 55 years   ( )

      Above 55 years   ( )

3. What is your marital status?

      Married   ( )

      Single   ( )

      Others   ( )

4. What is your teaching experience?

      1 – 5 years   ( )

      6 – 10 years   ( )

      11 – 15 years   ( )

16 – 20 years   ( )

21 – 25 years   ( )

25 – 30 years   ( )

5. In which year did you enrol for distance education ....

6. Which technology do you use in the course of distance education?

Computers   ( )

Phones   ( )

Video   ( )

Any other (specify)..

Computer availability at home among distance learners

7. a) Do you have access to a computer?

Yes ( )

No ( )

b) If yes, what is the major use of the computer?

To aid in distance learning   ( )

Entertainment   ( )

For my family   ( )

For social status   ( )

Any other (specify)..

c) If no, what is your reason?

I can't afford   ( )

It is of no use to me   ( )

I don't know how to use it   ( )

The cost of maintaining it is high   ( )

Any other (specify)..

8. How often do you use the computer for distance learning?

Very often   ( )

Often   ( )

Moderately   ( )

Rarely   ( )

Very rarely   ( )

9. In what ways has the home computer aided your distance learning?

It creates convenience when i want to check materials online or in softcopy ( )

I don't have to rely on the cyber cafes   ( )

I can read soft copies any time i want   ( )

I don't have to incur the cost of printing materials sent online   ( )

Any other (specify)...

Internet accessibility among distance learners

10. a) Do you have access to the internet?

Yes   ( )

No   ( )

b) Do you know how to use the internet?

Yes   ( )

No   ( )

Give a reason for your answer in (b) above

....

11. How has the internet helped you in distance learning?

I can access a variety of materials   ( )

I can communicate through emails   ( )

I don't have to go to cybercafés   ( )

Any other (specify)..

Competence of computer usage among distance learners

12. a) Have you taken any courses in computer packages?

Yes   ( )

No   ( )

b) If yes, what prompted you to do that?

For the fun of it   ( )

To improve my distance learning   ( )

It was a requirement from lecturer/ parent/ employer   ( )

To have basic computer knowledge just in case it will be needed somewhere ( )

Any other (specify)..

13. How would you rate your computer competence?

Very high   ( )

High   ( )

Average   ( )

Low   ( )

Very low   ( )

Gender differences in computer usage among distance learners

14. a) Are there gender differences in computer usage among distance learners?

Yes   ( )

No   ( )

b) If yes, what is the reason behind this?

Interest and liking   ( )

Level of computer skills   ( )

Attitude towards technology   ( )

Others (specify)...

15. Are there gender differences in relation to home computer availability and use?

     Yes   ( )

     No   ( )

Explain your answer

....

....

16. Are there gender differences in relation to internet accessibility?

     Yes   ( )

     No   ( )

Explain your answer

....

....

17. Are there gender differences in relation to computer competence?

     Yes   ( )

     No   ( )

Explain your answer...