

**ASSESSING THE USE OF COMPUTERS TO ENHANCE
TEACHING AND LEARNING IN PRIMARY SCHOOLS**

(A CASE STUDY OF NAIROBI PRIMARY SCHOOL)

By:

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**A Research Project Report Submitted in Partial Fulfillment of the Requirements for
the Award of the Degree of Master of Arts in Communication Studies in the School
Of Journalism at the University of Nairobi**

November 2011



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DECLARATION

I declare that this is my original work and has not been presented in any other University or College for examination or academic purposes.

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Supervisor: **Isaac Mutunga**

Date

DEDICATION

This project is dedicated to my loving wife Cecily, my lovely daughters Amani and Zawadi, my parents and family members whose dedication, prayers, resources and moral support have brought me this far.

ACKNOWLEDGEMENTS

It has been an exciting and enlightening experience particularly as a postgraduate student at the University of Nairobi's School of Journalism. I feel privileged to have had the opportunity to carry out this study as a demonstration of my ability to carry out serious scientific research in the field of Communication in general. I wish to recognize my professors, classmates and friends who have in one way or another participated invaluable in the realization of this study.

Undoubtedly, I am indebted to the all-powerful GOD for all the blessings he showered me and for being with me throughout the study. To my supervisor **Isaac Mutunga, I am deeply obliged** for his guidance and corrective criticism without which this study would not have come to this conclusive end. Finally, yet most importantly, I take this opportunity to express my deep gratitude to the lasting memory of my loving family, and friends who are a constant source of motivation and for their never ending support and encouragement during the study period.

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ABSTRACT

Much of the previous research into the computers and internet being used to enhance teaching and learning in primary schools mechanism has concentrated generally on developed countries. Not much known local study has focused on relationship between the determinants computers and internet being used to enhance teaching and learning in primary schools. This study therefore sought to fill the existing research gap by carrying out a survey study on the relationship between the computers and internet being used to enhance teaching and learning in primary schools. The main purpose of the study was to investigate into relationship between computers and internet being used to enhance teaching and learning in primary schools. This research was conducted through a survey study.

The target population of this study was the sampled respondents in the educational institution. This paper utilized the questionnaire and other data used in various previous research projects. This study collected descriptive data also. The data received was analyzed by descriptive analysis. From the findings, the study established computers and internet being used to enhance teaching and learning in primary schools should for sure be supported. This study therefore recommends that in order to avoid many impediments, institutions should make sure that its strategies are sufficient to enable administration and management of these facilities with management prudence and getting them advice promptly.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Effective Learning and teaching is a two-way communication process through which the teachers and students share and disseminate ideas and knowledge. This is opposed to one-way communication with teachers teaching and students as passive absorbers of materials. In this situation a student listen to the teacher as well as writing notes which are usually dictated by the teacher. In two- way communication there is usually a dialogue between the teacher and the student. The teacher gives work to groups of students. Each group is provided with a group sharing space, in which group members could share information, discuss questions, and work on the topic and as they continue the teacher usually intervenes.

Learning is the acquisition of knowledge or skills where interaction between the teacher and the student (Papaioannou, 2008). This means that in learning there is an exchange of information either in form of writing, speaking or using a common system of signs or behavior which can be regarded as communication. Communication is a continuous process that begins with a first encounter between people and does not end until the last encounter in their lives which involve functional messages that serve practical purposes, nurturing messages that convey a sense of caring and personal connection (Galvin, K and Wilkinson, C. 2006).

Communication can either be direct or indirect. Direct communication can be regarded as physical interaction especially in classroom where the teacher teaches children as they respond. Indirect communication is the form of communication where there is physical interaction between the teacher and the students.

Indirect communication in teaching and learning occurs when the teacher decides to use computer or any other ICT device to send the assignments to the students. The teacher can use internet or may ask the children to find particular information from the internet. Computers and internet enables sharing and dissemination of knowledge more effectively and to a large number of pupils using few the few teachers. Internet has rapidly become central in children's lives as

information medium to support school work (Livingstone, Sonia and Bober, M. 2004). Children regard the internet as the most useful tool for getting information that is useful in education process. In spite of homework given to children by their teachers, teachers further uses the internet to communicate to children and also retrieves the notes for teaching in classrooms.

Kwanya: (2009) notes that the technology that has had a great impact and application in communication is computer. It has been used in collecting, storing, retrieving and disseminating information. Use of computer and internet as a teaching and learning tool involves the student and teachers use of computer in order to exchange information and hence broadening their scope of knowledge. It has a vitally important role in fostering information literacy that supports teaching (Bennett, S *et al.* 2008). The computer can be used by both teachers and pupils to link people's ideas through use of internet. Pupils and teachers can send the information to one another. As such the student uses the computer via internet to send his or her homework to the teacher who in return uses the same method to either send or receive homework from the student. Therefore in Primary school computers allow students access to rich internet resources thorough research as guided by their teachers.

Internet is a global network of networks connecting millions of computers and other information technology tools to facilitate fast reliable information sharing (Kwanya, 2009). It enables people to share information and communicate to one another effectively.

In Cyprus computers have been used as dynamic tools in the teaching and learning process. Papaioannou, (2008) notes that the introduction of computers in primary schools which began in 1991 in Cyprus has enhanced use of computers for teaching and learning with access to the internet.

With the current advances in Information and Communication Technologies (ICTs) by way of improved computer power, faster data transfer rates, and attendant lowering of costs, coupled with the fact that the effective integration of these technologies into educational curricula has been demonstrated to have positive effects on student learning (Harvey, 2003; Kiluk, 1994; Salpeter, 1998). Technology-enabled instruction has emerged as the most feasible and economically sound means of expanding access to quality Primary education.

Use of computers and internet is being rapidly adopted by educational institutions worldwide as an alternate or complementary mode of education delivery, and indeed has been heralded as the next democratizing force in education (Jones, 1997). Learning and teaching is currently done through internet where the students have independence on the kind of material to retrieve. On the other hand a teacher can send an assignment to student at a particular time and request a student to send a completed assignment after completing it. Further computers have enabled rich and diversified communication products which were not initially possible like surfing the internet to retrieve materials for learning and teaching by students and teachers respectively (Kwanya, T: 2009).

Students use the internet as a medium to communicate, to find information, to have fun, and to do homework. De Bell, M. and Chapman, C. (2006) notes that email (or instant messaging and playing games are approximately tied for the rank of the second most popular internet activity (as well as computer), after completing school assignments. Thus, computers and internet enables students to participate in extra-curricular activities that aid learning.

In schools where there have been introduction of computers, there have also been improvement of grades, motivation and discipline in classrooms. This is attributed by the fact that computers have the potential to change schools so that learning in them is more student-centered and collaborative and more successful in terms of outcomes (Smeets, E. 2004). (This depends on the way the computer is used by the student). Jackson, L. *et al* (2008), notes that the amount of time spent using computers and internet was a positive predictor of academic performance, whereas amount of time spent playing videogames was a negative predictor. This shows that if student use the computer negatively a negative results will result while rightful use of computers brings positive results.

There is a high levels of online activity by many school aged children, particularly for helping with homework and for social communication (Bennett, S *et al*.2008).The learning benefits resulted by computer use in primary schools includes exposing students to additional resources such as online encyclopedia dictionaries, government – sponsored educational sites and learning games (The Students are able to perform basic tasks like opening programmes necessary for learning.

According to World Bank (2009) some of the impacts that have been found on computer learning includes (i) Students scoring high on subjects which they used computers for tutorials (ii) Lack of attaining higher scores in computer based laboratories (iii) primary school students who used tutorial software in reading attained higher scores in reading. while very young students who used to write their own stories scored significantly higher on measures of reading skills. This was an indication that computer learning affects the learning of a student. Computers have become important tools in today's society. Access to computers in schools exposes young people to information and communications technologies (ICT).

Computers and other forms of information and communication technologies (ICT) provide possibilities for changing the way children learn and teachers teach. A comprehensive survey on the state of educational computing indicates that the use of ICT is widespread in U.S. schools and is growing as teachers become more proficient with technology (*T.H.E. Journal*, 2001). The students surf the internet to retrieve material relevant to her or his learning needs without consulting the teacher. As a result they become more endowed with information. Further they are getting more current material to the extent that they surpass their teachers therefore the teachers are working extra hard to avoid embarrassment. This aspect brings about a resourceful society. Further in schools the teachers have changed from the traditional instruction method where the teacher has to use face to face method, currently they are sending their notes and assignments online especially during holiday season.

Most institutions within the sub-region are currently in a state of crises, having to cope with collapsing infrastructure, brain drain, and dwindling financial resources, whilst under increasing pressure to cater for larger student populations (Saint, 1999). Free primary education has allowed more students to be enrolled in primary schools around the country with no increment in number of teachers. The high student-teacher ratios cannot allow sharing and dissemination of ideas leading to lower standards of teaching and learning.

The introduction of computers and internet in primary will enable the teachers to work more effectively as they will be in a position to serve the student population even when they are physically absent from the classrooms. The teacher can give out work to the students and attend another class as the other class is continuing working out the solution. Later, the teacher may

come to the class and solve together the problem with the students. Further, primary school students are able to perform basic tasks such as using icons to open programs and more advanced tasks such as troubleshooting and working with design layout in absence of their teacher though under teacher's supervision.

In spite of the progress of the introduction free primary the number of challenges remain, including the high pupil-to-teacher ratio. The total number of teachers in Kenya's primary schools increased by 2.6 per cent between years 2002 and 2004. As a result, in some areas, the ratio is as high as 1 teacher for every 100 pupils. (13 April 2006: UNICEF correspondent David McKenzie) reports on the effects of Kenya's landmark abolition of school fees in primary schools.

The use of computers in school is a topic that has generated a great amount of debate. They have become a mainstay in the classroom environment, with many commentators citing a number of advantages, such as students learning necessary life skills, showing an improved attitude and enabling further development. Dwyer, J (2007) notes that computer based technologies enables young children greater opportunity for working with ideas creatively. Those arguing against the use of computers argue that they serve as a draw to children's attention away from their teachers and pose long-term health risks.

Teaching students the basics of computer use prepares them for life, as they gain valuable experience with word processors, presentation and spreadsheet software and use of the Internet. All of these skills transfer into the adult world, with many employers now expecting applicants to have these skills.

Many schools that use computers regularly have reported a positive impact on the independence of students. Children gain a boost to their self-esteem and provide them with a greater sense of control and engagement with the world. For a young child, working with computer based technologies allow for a more natural approach to thinking and working with ideas with less restriction on adaptations to prescribed linear approaches to thinking (Dwyer, J. 2007). Further, it adds a sense of responsibility when they are trusted to operate computers on their own. What they achieve through using a computer enhances. This leads to increased work levels and concentration and students place extra attention on the work they are doing. One particular example of improved self-esteem comes from using word processor spell checks rather than

having mistakes corrected by teachers. While this avoids a student feeling embarrassed at his error, the process of self-correction has shown to help students learn correct spelling and usage.

Using computers in schools allows students to unlock an endless amount of material. It helps the student in accessing a library of high-quality age appropriate titles spanning the product categories relevant to kids like creativity, storybooks, and reference which is essential for enjoying the full benefits of a computer. As a result they use less time for learning, are faster when they solve problem on their own and make few mistakes (Hilbert, T et al. 2008). In addition, the more advanced or simply curious student can do further research into a subject that interests her and build a broader understanding of a topic. One of the drawbacks is the amount of misleading or inaccurate material on the Internet.

The factors that are most important to teachers in usage of computers in teaching includes; making the lessons more interesting, easier, more fun for them and their pupils, more diverse, more motivating for the pupils and more enjoyable (Dwyer, J. 2004). Further the use of computer benefits the teacher in school in improving presentation materials, improves his or her self esteem while preparing the lessons and improves his or her efficiency while giving out assignments. In this case, pupils are able to get their assignments on time and if a child fails to turn up due to sickness or other factors, he/she is able to retrieve the assignment through use of internet.

The aim of this study is to assess the use of computers in primary school in enhancing teaching and learning. The study focuses the usage of computers in standard six, seven and eight pupils in Nairobi primary school.

The study adopted descriptive research design whereby qualitative and quantitative data was collected for the study. The study collected both primary and secondary data. For the collection of primary data, the study used questionnaires. The study used systematic sampling to come up with the sample of subjects. The study used descriptive statistics to analyze the data whose findings were presented using tables, figures, charts and graphs each of which was accompanied with interpretation in prose. Both quantitative and qualitative data was used in this study to collect primary data. Both the questionnaires and interview guide were used to collect data from students and teachers

1.2 Problem statement

With the introduction of free primary education in 2003, primary school enrollment increased. In Nairobi for instance this resulted in 48 percent of children between the ages of 6 and 13 years who were not attending school to join school. (*The Journal of Pan African Studies*, vol.2, no.8, March 2009). The increase in number of pupils in schools did not correspond to the number of teachers who were available. This increased teacher student ratio and classrooms available. The result has been overcrowding of students in classrooms leading to poor teaching and learning environment. Lack of teachers in primary schools has affected the general performance in National Examinations. The use of computers will enhance efficiency and fill in the gap of low numbers of teachers.

A nearly universal characteristic of a school is busy work station as a result of homework assignments, quizzes and tests, all of which are assigned so that students can practice and demonstrate skills mastered and knowledge remembered (Becker, H. 2000). The students are supposed to work at a given time to complete the workload and later give it to their teachers. As a result most students and teachers are involved in doing home-work and assignments and marking them or giving students feedback on their homework.

Computers help children to use all of their senses to extract information. Computers fascinate kids and can draw their full attention, which often results in a deeper focus and concentration which improves on their learning process (Conlon, T and Simpson, M. 2003). Further Children will also be able to complete homework on-line. In some places, if you miss school you can find out the assignments that you missed and catch up.

Computers help in teaching and learning among teachers and students. In learning computers have been used by teachers to get material through the internet, the students have been able to get knowledge.

Majority of computer using teachers use computers to help students' master basic facts or skills (Becker H. 2000). Teachers spend most of their working lives out of sight of other adults as in most cases they are with students in classrooms or in the school compound. Incorporation of

computer software into their teaching practice leads to access to other people from whom they can learn who includes experts or community of teachers / learners (Becker, H. 2000). In schools there are some subjects where computers are used more frequently than other. Becker, H. (2000) argues that those who use computer in the subject of mathematics tend to become exemplary computer using practitioners while those studying science and English depend on the presence of other computer users in order to develop high quality practices involving computers.

Computers help the students to work on their own learning needs. This means that a student is moved from class where most of the time is used in listening to the teacher as the lesson is presented to the whole class (Becker, H. 2000). This brings an aspect of independence where the student spends most of his time working alone. This is positive as it helps the students to do work tailored to their own learning needs. It may be dangerous if not used well as it can lead to loneliness and increase social isolation which may cause increase in hostility and aggression.

According to Higgins, S (2003.) computer is used by the learner and help in talking and thinking about the work. They are able to complete their homework and even find more information that can help them improve their performance. He further adds that computers help the students in talking and reasoning especially in a discussion (Higgins, S: 2003)

Teachers have been using computers to perform different tasks especially during their lessons (Smeets, E. 2005). These tasks include instruction, introducing topics, provide means for self study, and offer opportunities to learn concepts otherwise inaccessible to students this improves the intellectual capacity of the teacher which is passed on to the student.

The use of computers in schools has grown more diversified as educators recognize the potential of learning with technology as a means for enhancing students' reasoning and problem solving abilities (Conlon, T and Simpson, M. 2003).

Computers have increasingly pervaded people's everyday lives. They have been used in homes, hospitals, schools and other areas that have interconnection with human beings. Computers have been used to deal with the many problems facing human societies in the world (Hitz, S. 1994).

The study assesses the use of computers to enhance teaching and learning in Primary schools in Kenya. Survey research method will be used to carry out the research. Systematic random sampling will be used to sample students from standard six, seven and eight pupils at Nairobi primary school. The study will be guided by the following research questions;

1.3 Research questions

1.3.1 General research question

How are computers and internet being used to enhance teaching and learning in primary schools?

The study was based on the following Specific research questions;

- i. How effective is the use of computers in learning in primary schools?
- ii. What is the effect of computers in enhancing learning among pupils in primary schools?
- iii. How effective is computer as a communication tool to aid teaching in primary schools?
- iv. What are the challenges of using computers in primary schools?
- v. How can computer and internet are use effectively to enhance teaching and learning in primary schools?

1.4 Justification of the study

There has been growing interest concerning the use of computers and internet to enhance teaching and learning though this interest has not been matched by sufficient research and theory. This study will be important in bridging the gap that exists on the use of computers in primary schools. The knowledge will be vital for those who will engage in literature review on the use of computers in schools.

The study will help the teachers to understand the barriers that exist in extending the practices of using computers in primary school. Further the teachers will be confident in expanding the use of computers by their students by assigning more work and encouraging them to research more on

the subject under study but cautioning them on negative effects of the computer. The schools will be able to come up with policies and practices regarding the use of computers by all students. This includes allocation of resources for computers, coordination and staff development. Further the school administration after studying the impacts that have been brought about the use of computers, those schools who have not started using computers in primary schools will be in a position to avail resources to the teachers and teaching requirements necessary for employing use of computers for learning in primary schools.

Since computer and internet use is being used in primary schools, the stakeholders who include teachers, government and parents will find ways of dealing with associated risks. The government will be able to put policies guiding the children from these risks while the parents and teachers will be able to guide their children both in school and at home.

Given the ever increasing growth of computer use in education, it is essential for researchers to investigate its impacts in primary school learning. This entails the role which has been played by introduction of computers to students. In this option the focus is on class use of computers to support and or enhance the teaching or learning process, such as use of computers for demonstration, drill and practice, instruction, and differentiation (<http://urgent.acadmia.edu>). Most of the teachers use computer for support in educational practice while fewer teachers integrate computers as a teaching tool or a learning device.

1.5 Scope and limitation of the study

The study will focus on primary school pupils and teachers at Nairobi primary school because the researcher teaches there and therefore it will be possible to carry out the research within the time frame. Also, the school has started a program of using computers and internet to enhance teaching and learning.

The study will not focus on other areas of ICT like mobile telephony, television but will only focus on computers and their use by teachers and students to enhance learning. Further the study will not focus on private schools because of time and finance.

The study will use both primary and secondary data collection methods. The cluster sampling method will be used to select the pupils in standard six, seven and eight which have a population sample of 202, 197 and 192 respectively.

1.6 Hypothesis

The study will be guided by the following hypothesis.

H₀1 There is a significant relationship between effective learning and studying and use of computers in primary schools.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction

Teaching was difficult before introduction of computers as there was no dialogue between the teacher and the students especially when the students are out of school. But with the introduction of computers the students are able to work out their assignment and further the teacher teach to their specific classroom requirements (Hilbert, T *et al.* 2007). Use of computers by students has made it easier for teachers to make a follow-up work on their students. Students learning with worked-out examples usually require less time for learning, are faster when they solve problems on their own and make fewer mistakes. Further the student can use his or her working memory capacity to understand the solution procedure and then send the work via internet. This usually helps the teacher and the student to work together even if they are far.

This chapter is divided into the following topics; uses of computers benefits of computers factors affecting use of computers challenges of computer usage in learning and teaching and finally the theoretical framework.

2.1 Literature review

The computers are used by primary teachers to produce reports for parents, create teaching resources and to download curricular materials from the Web (Conlon, T and Simpson, M: 2003). Further the teachers are able to communicate with their colleagues, parents and students. The pupils are able to complete their assignments by use of computers.

Computers, though at a lesser extent are used for enabling slower pupils to exercise more or longer, for presenting additional learning materials or task to advanced pupils or for presenting different activities to different pupils according to a study done in Dutch primary schools on ICT (Smeets, E:2005).

Use of computers in teaching and learning encourages both students and teachers to become content producer and as a result it encourages the student to engage with learning more effectively (Yelland, N: 2001). This helps the student to become more confident while doing his/her assignment. The student due to good conceptualization of material will be more competent in his/her learning process.

Young children are now spending substantially increased amounts of time learning using computer-based technologies which draws attention to the learning that is taking place and the environments being established to facilitate this learning (Dwyer, J. 2004). This has been experienced both at home and at school.

Computer equipment and software are becoming increasingly available inside educational establishments as well as in private households - not only for school activities of young people, but also for lifelong learning of all generations (Scheuermann, F *et al*: 2009). Young children have dramatically increased the amount of time they spend using the home computer independently both in the years before school and after beginning school (Dwyer, J. 2004). The usage of computers in home occurs when pupils are doing their assignments.

Computer usage in primary schools depends on the partnership which exists between the teacher and a pupil. They engage in a partnership of learning where there is collaboration among them. Participants learn and have a dynamic relationship (Yelland, N: 2001). Fitzpatrick (2004) notes that computer is a social facilitator in the sense that it provides opportunities for collaboration, group work and interaction which fosters cognitive change. This collaboration rises opportunities for learning.

Literature according to Higgins, (2003) shows that technology can aid struggling learners in both their cognitive work and self esteem, with each contributing to the other. Most at-risk learners feel alienated from, and struggle academically in, mainstream educational settings, yet respond favourably to individualized settings that allow them to learn as they need, and interact differently with content and with others.

Hegarty and Johnson (2003) share the outcomes from a project on web-based learning for pupils. Websites of personal interest were used to motivate these learners to develop a multimedia piece

that linked back to them. They found this as a powerful motivator as the learners, not the teachers, drove the work. As well, they found that multimedia computers could offer optimal learning experiences, yet caution its use citing Maddux (1994) who finds technology creates a new series of problems. Some problem areas to consider are access issues, limited reading abilities, slow downloads, and inappropriate websites. They go on to suggest strategies to overcome these, such as sufficient staffing of facilitators, customized sessions, less use of image heavy websites, and finding websites that cater to accessibility issues, such as those with physical impairments. Overall, Hegarty and Johnson (2003) found that this exercise of finding websites of interest and building a multimedia project enabled students to practice and develop skills in important areas. These areas were increased literacy and technical skills, concentration and focus, and participation and communication.

Wallis (2004) reviews the use of computers in her teaching practice with at-risk learners. Her particular body of students struggle with ADHD (Attention Deficit Hyperactivity Disorder); however, she offers a useful perspective on effectively using computers for all students who struggle with learning. One aspect she mentions, citing Lewis (2000), she applauds computer-based learning for its ability to provide immediate feedback, self-paced learning, and individualized instruction. Findings showed that students had increased self-esteem and were more enthusiastic towards school. Wallis continues in citing Higgins, (2003) who echo these benefits of computer use, adding this medium increases novelty due to its simulated environment. Another important factor with technology Wallis points out is the use of organizers, such as calendars, program outlines, and graphic and colour coordination. These tools, easily provided digitally, help students navigate through curriculum and stay on task. Last, Wallis shares how students learn more effectively with mastery learning in a computer setting. She deems computers as forgiving allowing students many opportunities to arrive at the correct answer. Well-designed software can provide prompts after a number of attempts by the student, and automatically offer higher levels of challenge by monitoring patterns of answers inputted by the student. She furthers, these navigational aids and self-paced learning features give students independence in their learning and helps them stay on task (Wallis, 2004).

Christie and Sabers (1989) provide results from a summer youth program that worked to increase academic and employment opportunities for high-risk and minority adolescents. One section of the program incorporated the use of technology. Christie and Sabers (1989) are of the same mind that academic difficulties of these youth may not solve through traditional educational settings. Therefore, they sought to develop a program that overcame some of these barriers by focusing on social bonding, helping alienated at-risk learners to have a sense of community and connection. Technology was able to support this need.

First, the students found computers provided an accurate and unbiased response to their work, thus relieving the teacher of that role. Second, student-teacher relationship, and student-student interactions changed to one of help and collaboration. The main reason for this, Christie and Sabers concurred, was that the locus of control was in the hands of the students giving them freedom and responsibility at the same time.

In their study, (Christie and Sabers) recommended that a significant portion of the technology budget should be allocated for professional development. Schools typically devote no more than 15 percent of their technology budget for teacher training, but a better amount would be 30 percent (Office of Technology Assessment, 1995). As well, technology can support mastery learning through concrete step-by-step instructions, a vital learning strategy for poor learners. Christie and Sabers (1989) posit mastery learning designed with technology offers repeated exposure to the content, consistent presentation, unbiased scoring, and immediate feedback. Overall, they saw technology increase the tie between academic learning and the educational setting as learners discovered the appeal of this learning venue.

Waxman and Padron (1995) focused on improving instruction for at-risk learners by first recognizing their shortcomings and learning characteristics. They acknowledge most at-risk learners come from disadvantaged circumstances, and further suggest conditions in schools and classrooms may alienate rather than accommodate them. They offer some alternative approaches to teaching at-risk learners, such as cognitively guided instruction and learner-centred instruction through the use of technology. More specifically, Waxman and Padron report several examples of improvements when at-risk students use technology to learn. These areas are improved attendance, achievement, and behaviour. They determine that certain characteristics of

technology contribute to these actions by providing motivation, autonomy, self-paced learning, non-judgmental feedback, and mastery of content, contributing to an individualized learning approach. As well, technology facilitates more communication through social integration with students, especially those who are shy or embarrassed to interact in traditional ways (Waxman & Padron, 1995).

Computers are no longer a luxury to which only the elite have access. Because of the availability of computers in public libraries and schools, more people have the opportunity to learn and use them for their personal and professional lives.

2.2.1 Uses of computers

Higgins, S (2003:16) notes that computers can be used by teachers to present and demonstrate as part of learning and teaching. The pupils can be given an assignment to work either on their own or in groups. He further argues that the choice of how and when to use computers for teaching and learning is complex as it depends on an individual (Higgin, S.2003:16). Computers are typically used for drill and practice and typing of assignment for pupils either at home or in School (Higgin, 2003). It is used by teacher in compiling the assignment which are given to the students and also compiling the list of grades of students.

According to Suppes, P. (2003), computers help to collect systematic data on how children succeed in the process of learning a given subject. This helps in classifying the student and comparing different curriculum approaches. The computer further can evaluate a pupil in daily performance. In case of Schools which uses computer in language learning, the teacher will be able to see the progress of the pupil and further the student can evaluate his/her progress. This is usually possible through use of individual exercises. Suppes, P (2003) further noted that computer usage will have importance and consequences for all students in the immediate future as even if they are not receiving computer assisted instructions, the results of such instruction will be used to revise and improve ordinary texts and workbooks. Therefore the access of books and journals through internet is of great help to the student. This has been made clear through introduction of online services where a pupil can retrieve any kind of material from internet.

Computers help the students to work on his own Suppes; P. (2003) notes that the student is able to have some classroom practices and therefore supplementing the teacher's instruction. Before the age of computers the pupils had to wait for their teachers instruction in case of a problem with an assignment but currently the student only need to go via internet and find way to solve a particular problem. In this way the work of the teacher is simplified. Suppes, (2003) further noted that for a child in the first year in primary school, they learn faster to type their names through use of computer. This usually motivates the children and put more effort even to learn more.

Computers stores data both of large body of curriculum material and the past histories of students working in particular curriculum (Suppes, P. 2003) this helps the teacher to evaluate the performance of the pupils in a class in a particular year and also deal with gaps if any in his or her curriculum. Further, it will help the teacher in classifying the students according to their need as well as compare different curriculum approaches to the same subject (Suppes, 2003).

Hibert, et al (2007) argues that computers helps in learning from worked out examples which help the students to gain better understanding particularly in initial cognitive skill acquisition. This is a situation where the student has a problem formulation as well as the solution of a problem. They further argue that in worked out examples the students require less time for learning and is faster when they solve problems on their own and make fewer mistakes.

Conlon, T and Simpson M (2003) notes that with use of computers the teachers are able to complete their administrative tasks more efficiently and they prepare for teaching with more depth and breadth. There is effectiveness in the way they prepare their lessons.

Smeets, (2005) notes that computers provide opportunities to access to abundance information using multiple information resources and viewing information from multiple information sources and viewing information from multiple perspectives that are fostering the authenticity of learning environments. Therefore computer makes learning easier by making a student to have a logical flow of learning materials. It further proves opportunities for adopting the learning content and tasks to the needs and capabilities of each individual pupil and providing feedback about the student.

Use of computers helps the students to develop skills in learning how to learn, which will benefit them in the long term and enable them to interact with people and ideas in a borderless manner. This leads to self esteem of a student and further affects positively their motivation and interest (Yelland, N 2001)

2.2.2 Benefits of computers

Computers benefit children both cognitively and socially. Computer use leads to enhanced mathematical thinking, increased creativity, higher scores on tests of critical thinking, higher scores on standardised language tests and higher levels of motivation (Fitzpatrick, M: 2004).

As teachers and pupils convert from non-users to regular users of ICTs for teaching and learning, they in parallel learn how to use them in optimal ways (Scheuermann, F.*et al.* 2009). That means as they learn something new, they learn new ways to learn.

Computer ‘marking’ of work in simple practice tasks across the curriculum and more sophisticated ICT programs have all produced evidence of improved pupil attainment (Higgins, S: 2003). Computer helps in improving the performance of students hence motivating their teacher and themselves.

Computer use in primary schools expose students to additional resources, such as online encyclopedias, dictionaries, government-sponsored educational sites, learning games and online tutoring. They help children to use all of their senses to extract information as they fascinate kids and draw their full attention which results to a deeper focus and concentration (Livingstone, S. and Bober, M. 2004)).

Computers help pupils to learn and teachers to teach effectively. It can be used individually, in small or large groups or by the teacher with the whole class. In each of the approach the teacher uses different opportunities to help the children to talk and think about their work. In Kenya, computers are used by the teacher with the whole class. According to a study done by Momanyi, L et al (2006) it was noted that in Kenya 88 percent thinks that having computers in schools

offered a variety sources of learning. 52 percent thought computers helps students to become more independent of teachers. 88 percent thought that computers keeps the student with the current knowledge.

2.2.3 Factors affecting use of computers

There are several factors which prevent teachers from using computers. Some factors include lack of teaching experience, support for teachers using computers. Lack of help in supervising children when using computers, unavailability of computers and lack of financial support (Mumtaz, S: 2000).

Teachers usually play a low profile status by distancing themselves from computers due to lack of technical knowhow of computer (Mumtaz, S: 2000). They feel challenged due to their incapability when it comes to computer usage. Teachers who are regular users of computers are usually confident with computers. They perceive it to be useful for their personal work and for their teaching, like making the lessons more interesting, easier, more fun to them and pupils, more diverse, more motivating for pupils and more enjoyable (Mumtaz, S:2000). As a result they are prone to become more adept at using computers to advance in their teaching.

Teachers are motivated to use computers because of personal gains in learning and development because they are able to retrieve notes from internet and are able to deliver them with confidence (Mumtaz, S. 2000).

Yelland, N (2001) argues that teaching and learning should be student oriented whereby the teacher adopts a role which is less authoritarian and more one of encouraging and guiding the learning of their students towards goals that have been defined by them and the curriculum. Learning with use computers helps both the teachers and students to interact, and exchange ideas and knowledge at all times and not only during class time.

The teacher using the computer should be confident and competent with the range of applications that are available to support their teaching and student learning. Johnson (2000) argued that the interaction of computer availability and teachers' preparation is critical to understanding the effectiveness of computers in the classroom. This means that computers have to be accessible

and ones' computer expertise in order to talk about computer effectiveness but lack of one aspect lead to biased information.

2.3 Challenges of computer usage in learning and teaching

The computer technology changes rapidly and new innovations offer new possibilities for teaching and learning (Higgins, S: 2003). This means that both the teachers and the students need to change with computer technology. The change may be both in context and in content.

Lack of expertise by teachers in the early primary years was apparent, lack of expertise not only in their own ability to use the computer but in how to integrate computer based learning into the early childhood environment (Dwyer, J. 2004). This is exacerbated by limited resources available such as internet sites suitable for young children.

Use of computer can be disastrous especially when a teacher is not able to use it effectively and efficiently. The teacher has to give time to student to think over incase he or she is employing worked out examples using computers in the classrooms (Hibert, T. et al: 2007). Further, not all the children have the same cognitive level (Suppes, P: 2003). Therefore teachers employing worked out examples in their classrooms have to know how to effectively employ these examples (Hibert, T et al. 2007).

Conlon, T and Simpson, M (2003) notes that use of computers in learning and teaching alienate and dis-empower teachers from direct interaction with the student. As a result, the student does not see the need of teacher in the classrooms. Smeets, E (2005) argues that teacher is no longer the all knowing controller of activities hence the pupils may lack confidence with him/her especially when they realize that he is a learner and explorer with them. Momanyi et al (2006) notes that use of computers for teaching and learning contradicted the human role of the teachers.

Teachers tend to ignore use of computers in schools primary schools because they are disturbing (Smeets, E: 2005). They feel that more time will be wasted. Mumtaz, S (2000) notes that teachers with negative attitude towards computer use tend to be negatively disposed towards using it in classrooms and further distancing themselves from computers.

Though there have been introduction of computers in primary schools, lack of policy guidelines have impacted on student opportunity for computer based learning in the early primary years, specific guidelines given by the government about how computers could be integrated in the existing curriculum (Papaioannou.2008.Dwyer. J. 2004). This leads to confusion as each school usually uses it own way of implementing computer use in learning and teaching.

According to Dwyer, J (2004) older primary year classrooms are prioritised over the younger year levels in terms of distribution of school computer based resources. As a result there are fewer computers which are older and of poorer quality in early years. The older computers in the early years classrooms limits the potential young students from accessing while working in the classroom.

Use of computers in learning in primary schools has not been fully embraced by most of primary school teachers as they express concern regarding the negative impact of use of Computer in learning in the primary school on a young child's development (Dwyer, J. 2004). One of the negative aspects of use of computers by children is that it may isolate children from one another in a pre-school environment (Fitzpatrick, M: 2004). As a result teachers lack commitment to computer use in learning with young children which suggests an overall lack of understanding of the capabilities of young children and the potential learning gains got while using computer. This is lack of understanding of both the capabilities of young children and of the potential of computer in learning (Dwyer, J. 2004).

2.4 Theoretical framework

Every system is shaped by the prevailing paradigm. As society innovates itself, it also adjusts its mechanisms to new situations. The phrase *information society* is one of the mechanisms suggested to adjust to new situations; it is to diffuse the innovation (Askar, 2004). On the other hand, in spite of the easily visible changes and adaptations in companies, it is hard to say this for educational organizations or schools.

The use of computers in schools for the purpose of teaching and learning is a kind of diffusion process in which the computer is an innovation that is defined by Rodgers (2003,) as “an idea, practice or object that is perceived as new by an individual or other unit of adoption.” In fact,

computers. as a relatively new building block in the educational system. cause innovations that range from ways of communication. to teaching methods. to educational material and school management. As Rodgers points out, getting a new idea adopted. even when it has obvious advantages. is difficult.

In this study, the diffusion of computers in schools is ideal in the light of the theory of the diffusion of innovation. The theory diffusion of innovations was proposed by a French sociologist in his research of 1903 (Gabriel Tarde). Diffusion of Innovations is defined as the process by which an innovation is communicated through certain channels over time among members of a social system. The sociologist plotted the original 'S' shaped diffusion curve. His 1903 curve's current importance is borne of the fact that most innovations have an 'S' shaped rate of adoption (Rodgers 1995). Diffusion research centre on the conditions which increase or decrease the likelihood that a new idea, product or practice being adopted by members of a given culture in this case the use and adoption of computers in primary schools a case study of Nairobi Primary school.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter specifically deals with the methodological aspects of the study. It outlines the areas where research was conducted, how data was collected, analyzed and presented.

3.1 Research design

The research design used in this research was descriptive. Both quantitative and qualitative data were used. Research instrument in this study included questionnaires comprising of both structured and unstructured questions and in-depth interview schedules. Descriptive design was chosen because it is appropriate to review facts as it yields a great deal of information (Shuttleworth 2009). The descriptive research is description of the state of affairs as they exist (Kombo, D. and Tromp, D. 2006). It is important while collecting people's opinions and attitudes as in this study we are focusing on both teachers and pupils' opinion on the use of computers.

3.2 Study area

The study was carried out at Nairobi primary school. It is located near the hostels of University of Nairobi on Mamlaka road to the South and State house road to the North at a capital city of Nairobi. Nairobi primary was selected because it has a population of 1740 pupils and 63 teachers. In 2009 it was in position 3 in Nairobi. The school was started in 1902 by the British colonial government. The other reason for choosing Nairobi primary was that it is among the few public primary school that has adopted use of computer and internet. Also it is heterogeneous with students from different social and economical backgrounds that make it ideal study area.

3.3 Target population

Table: 3.1 Student population in Standard six, seven and eight

Class	Number of Male pupils	Number of Female pupils	Total number of pupils
Standard 6	109	93	202
Standard 7	82	115	197
Standard 8	89	103	192
Total	280	311	591

Source Nairobi Primary: 2011.

This consisted of pupils in standard six, seven and eight because of experience on usage of computers. They are 591 pupils. There were 55 female and 8 male teachers in the school.

3.4 Sampling design

The study employed probability sampling. Systematic sampling was used to sample the subjects from standard six, seven and eight. Systematic sampling is an improvement over a random sample in as much as it is spread more evenly over the entire population (Kothari, 2004).

Another reason why systematic sampling was used was that there was a list of all pupils in standard six, seven and eight. Systematic sampling is used when list of population is available and is of considerable length.

The sampling frame was drawn from the total number of pupils in standard six, seven and eight. Standard six, seven and eight have 202 pupils, 197 pupils and 192 pupils respectively. The total number of pupils is 591. Systematic sampling was used by the researcher to select 118 respondents from a sampling frame of 591 pupils from standard six, seven and eight. To ensure reliability of results the researcher made the sampling frame of 591 pupils under study.

The sampling interval of Kth number will be 5.

$$\text{Kth total} = \text{number of cases of population}$$

$$\text{Desired sample}$$

Therefore
$$\text{Kth} = \frac{591}{118} = 5$$

118

The final selected sample from 591 respondents was 118 pupils. The sampling frame which included the class list as per registers were used in order to give both boys and girls in the class the equal chance.

Key informants were selected directly from the school and the larger community using purposive sampling, where only the individuals knowledgeable to the subject on computer and internet were be consulted.

They included the head teacher, 11 teachers, and two owners of private schools and one official from the ministry of education in this case the Nairobi provincial director of education. The community leaders were church leaders who run church owned schools.

3.4.1 Sample size

The sample size will be 118 pupils. 11 teachers. 2 owners of private schools and official from Ministry of education and two community leaders. Sample size according to Kothari (2004) refers to the total number of items to be selected from the universe. To ensure validity the confidence level will be of 95%. According to Kothari (2004). the confidence level or reliability is the expected percentage of times that the actual value will fall within a specified precision limits, it indicates the likelihood that the answer will fall within that range

3.5 Data sources, data collection methods and Research instruments

The study used both primary and secondary sources to ensure validity and reliability of the data.

3.5.1 Primary data

Primary data is information collected directly from respondents. (Kombo, D. and Tromp, D. 2006). It was collected from pupils selected from the sampling frame from standard six, seven and eight, who were requested to give out the information freely. Secondly data was gathered from the key informants who included, the head teacher, eleven teachers dealing with computers in the school, an official of ministry of education, church leader and owners of two private schools. Secondary data was from school reports of the student's performance before they started using computers.

3.5.2 Research instruments

Two instruments were used to collect data. These instruments were questionnaires and key informant guide. Questionnaire was used as the main instrument while the key informant guide was used as a supplementary to questionnaire. The researcher read out the question to the respondents and then the researcher wrote down the responses himself.

Face to face interviews were conducted. The questionnaire contained both open and closed ended questions. An in-depth guide administered to the key informants was administered. The

questionnaire was to facilitate collection of quantitative data while key informant guide which involves in-depth interview was designed to yield qualitative data.

3.5.2 Secondary data

The secondary data was collected through desk review by analyzing documents related to computer and internet learning and teaching in primary schools. The research consulted the Kenya National Bureau of statistics library, institute of African studies (IASS) library at Museum, Jomo Kenyatta Memorial Library and sources from reviewed journals from the internet.

Secondary data is important because it reveals the nature of the study and identifies the areas to be tackled. Desk research captures the other aspects of study not captured in primary data.

3.5.3 Primary data

Questionnaires were used as the main instrument of collecting data. The questionnaires had both structured and semi structured questions, key informant guide was used as supplementary to questionnaires. Unstructured questions were used in key informant interviews.

3.6 Data analysis and presentation

The quantitative and qualitative data was collected. The study used descriptive statistics methods where it is presented in text and statistical illustration form which includes tables and figures, pie charts and bar graphs. Chi-square test was used to test the hypothesis. Chi-square test will be used as a test of independence where that test will enable the researcher to explain whether or not two attributes are associated (Kothari, C. 2004: 237).

The qualitative data was categorized and summarized into themes.

3.7 Ethical considerations

Prior to the study clearance was obtained from the Nairobi primary school administration. The parents and guardian of sampled pupils were informed of the intended study and the aim of the study and their consent was sought. Further, the pupils were asked of their consent before continuing with the interview. They were asked to offer the information voluntarily.

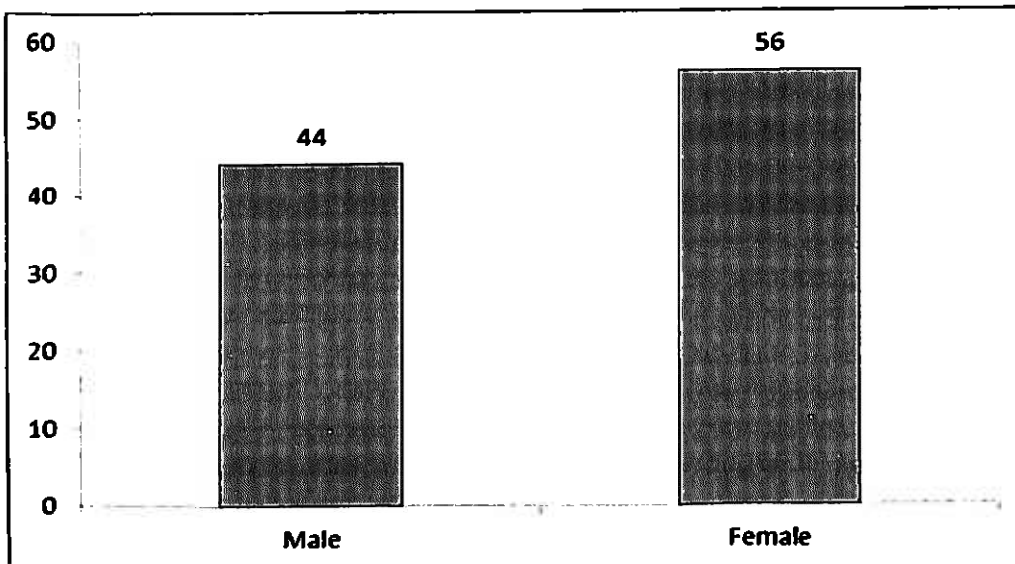
CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Background information

This chapter describes the research findings and data analysis of the data collected from the respondents. Quantitative and qualitative data analyses were used. Correlation analysis was applied to show the relationship between variables. Various tables, charts and bar graphs and diagrams were used to present the data for easy interpretation by the readers.

Figure: 4.1 Computer use of the respondents

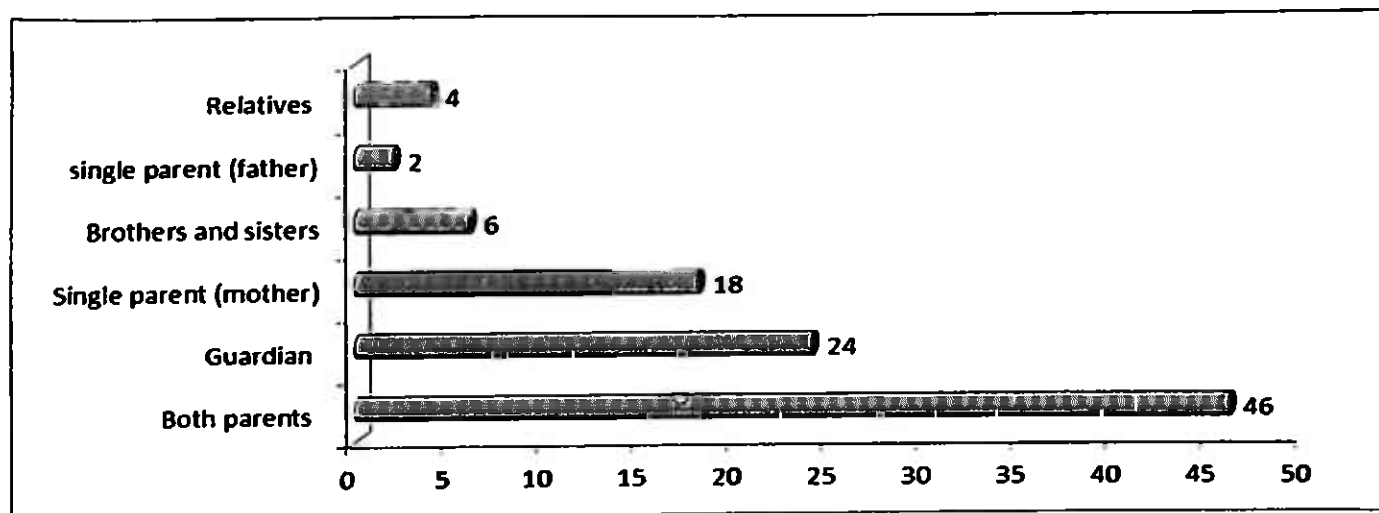


Source: Researcher, 2011

Majority of the students were female comprising 56% while 44% were male. The study established that females were more conversant with computer use than boys thus had a competitive edge on subjects taught with computers. This result depicts the ease at which deferent computer use adoption to technology acceptance. Technologies should be equally accessible to male and female students. Yet, as children enter adolescence; large numbers of

them tend to lose interest in science and math. Children are narrowing the computer use gap in science and math, but not in technology (Closing the Computer use Gap: Computer use Gaps Fact Sheet, 1997). Overall children' test scores and course enrollments have risen in these areas. In order to attempt to address this issue, the cause of the discrepancies between males and females in computer use must be established.

Figure: 4.2 Who do you live with?



Source: Researcher, 2011

Results showed most students lived with both parents (46%) while 24% lived with a guardian. 18 percent lived with a single mother parent, with 6% living with their brothers and sisters. Parents are the most important, influential people in a child's life" (Canter, 1991). Parental views on computer use roles, belief systems regarding computer use, and actions toward both sexes will inevitably influence children. Children are sent strong signals about the certain activity around them, more specifically about technology, from parents. Parents' actions and words send messages about the parents' beliefs. Parents should closely examine whether their technological adoption are telling their children what they wish them to do. Parents should closely examine what they do. Most of the respondents as indicated above lived with their parents and that was a plus in computer usage for learning in Nairobi primary school.

Table: 4.2 Whether parent regularly use computer

	Frequency	Percent
Yes	98	83
No	20	17
Total	118	100

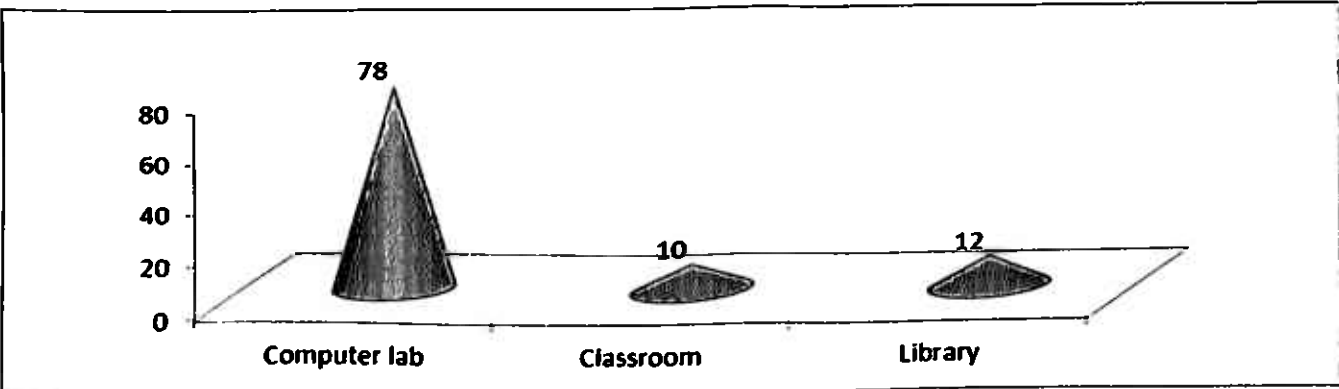
Source: Researcher, 2011

Most of the students' parents comprising 83% used computers regularly while 17% of the student's parents never used computers. This indicates that computer use by the parents prompted the children to know about computer use owing to early exposure. Parents have the greatest potential to influence their children. Teachers and the educational system also have the ability to shape the self-images and futures of children as they approach computers and computer fields. Though it can be argued that they have less influence, software manufactures and Internet providers also take part in encouraging or discouraging females in technology use. Parents, the educational systems, and manufacturers have the ability to help children overcome the computer use gap in technology.

If we want to see young people more involved in computers, we must begin with parents. There are many practical and easy ways parents can encourage their children in the use of technology. Parents can begin at home to encourage children to use technologies. Several ideas for encouraging children' interest in technology have been adapted from the recommendations of Dr. Janese Swanson (Swanson, 1999). First, children should be exposed to technology at an early age. Children should learn that technology is fun and helpful to use. They should see it as one of the many tools in our world that make life easier. When children are ready to be active participants in using technology, parents should be ready with opportunities to use it. Parents should also buy technology products of interest to their children. Unfortunately, a majority of the CD's for children are designed for the interests of boys (Adelson, 1996). Children rarely have interest in monsters or weapons commonly seen in computer software. Rather, they tend to want

to accomplish a specific goal using the computer. As a result, it may be more challenging to find programs that will interest young children. "Barriers are lifted when children play with other children and have equal access to the control devices such as the video game control pad, keyboard, joystick, or mouse" (Swanson, 1999). Another opportunity to encourage children's use of technology is to get the child involved in computer in specific clubs such as a children's computer club. Dr. Swanson also encourages mothers to play with computers and other technology with their children. Support from parents encourages children to develop their skills with technology. The one-on-one interaction between mothers and children can be greatly beneficial to both. Discussing technology with children is yet another way for parents to encourage technology use. Parents should ask children about their likes and dislikes of computer games played, Internet sites visited, and issues surrounding computers and the Internet (Swanson, 1999). Sharing and validating children's opinions strengthens their confidence. The greatest piece of advice from Dr. Swanson to parents is to be role models for their children. Children often imitate parents' priorities, attitudes, and actions. When parents use technology comfortably in their daily lives both for entertainment and in their professions, their children will be more likely to do the same. The Nairobi primary school pupils observed that there was need for their parents to actively engage more in computer use since their engagement is deemed critical in overall computer use.

Figure: 4.3 Where you use your computer in school



Source: Researcher, 2011

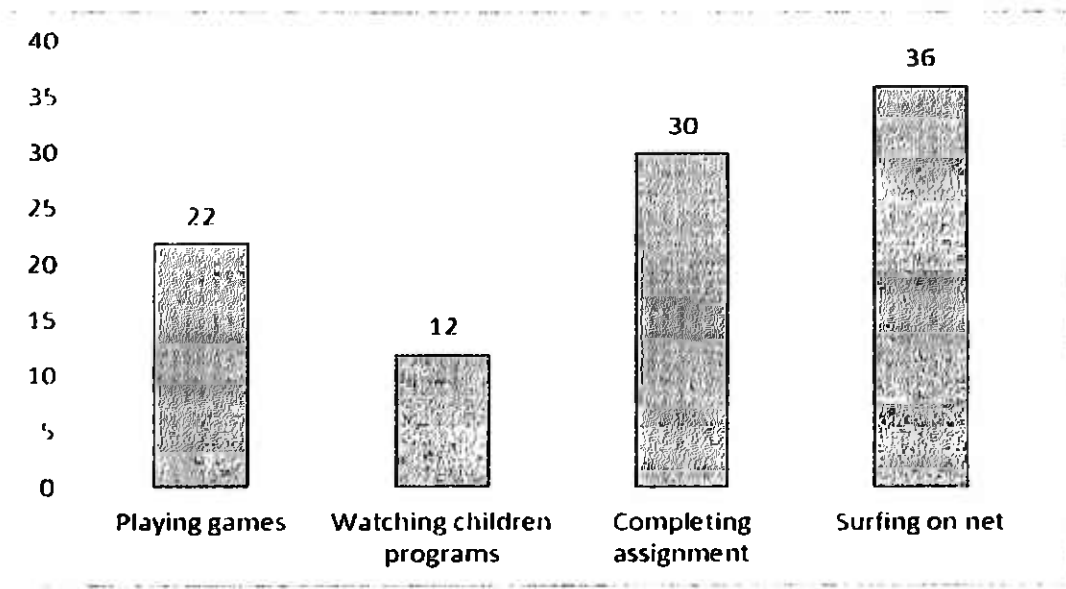
Most of the students use computers in computer laboratories comprising 78 percent while 12 percent used computers in the public library. 10 percent used computers provided by the school in their respective classrooms. Majority of the students did not have a computer and none of the students took a computer to school. The students further posited they indeed need their own computers.

Table: 4.3 Number of students who have access to computers at home

	Frequency	Percent
Yes	78	66.1
No	40	33.9
Total	118	100

The research sought to establish the number of students who had access to computer at home. As shown in table....above, the majority of the students (66.1%) had access to computer at home while 33.9% did not have access to computers at home. Encouraging technology use for children often goes beyond simply using the computer and encouraging children to use the computer. Mount Holyoke College has put together several helpful reminders and suggestions to help parents know what to do for their children (Expect the Best from a child. That's what you'll Get.). The first suggestion is for parents to remember that their words are very influential. Parents need to be very aware of how they speak to their children. More specifically to this issue, parents need to be conscientious of how they speak to their children about technology. Secondly, children should be encouraged to use computers in a variety of ways for fun and work. A third idea is that parents should also go beyond technology and encourage all types of activities for children.

Figure: 4.4 Use of computer at home



Source: Researcher, 2011

Most students used computers at home to surf on net (36%) while 30% used computers at home to complete assignments. 22 percent used computers at home to play games. Children should be encouraged to take part in experiences and activities that are traditionally designated for boys or men. Children are often enthusiastic when parents suggest that they assist them in nontraditional activities such as building a dog house or fixing the car. For a variety of reasons, parents do not always think to include their children in these activities. Yet another idea from Mount Holyoke College is for parents to discuss stereotypes openly with their children. Stereotypes can strongly influence people's perspectives and attitudes toward themselves and others. Parents frequently assume that children understand their ideas and beliefs they have toward others, but children get the strongest sense of their parents' beliefs when issues are discussed. Children can feel free to share their questions and concerns with their parents. A fifth suggestion is for parents to strongly encourage and praise children for their abilities and ideas instead of doing so only for their appearance and cleanliness. Children learn what is important to parents from what parents reward or praise. If children are praised for their skills, creativity and ideas, they will desire to strengthen or develop them. Still another suggestion to parents is to allow children freedom for independent thinking. Children who become independent thinkers and problem solvers fair better

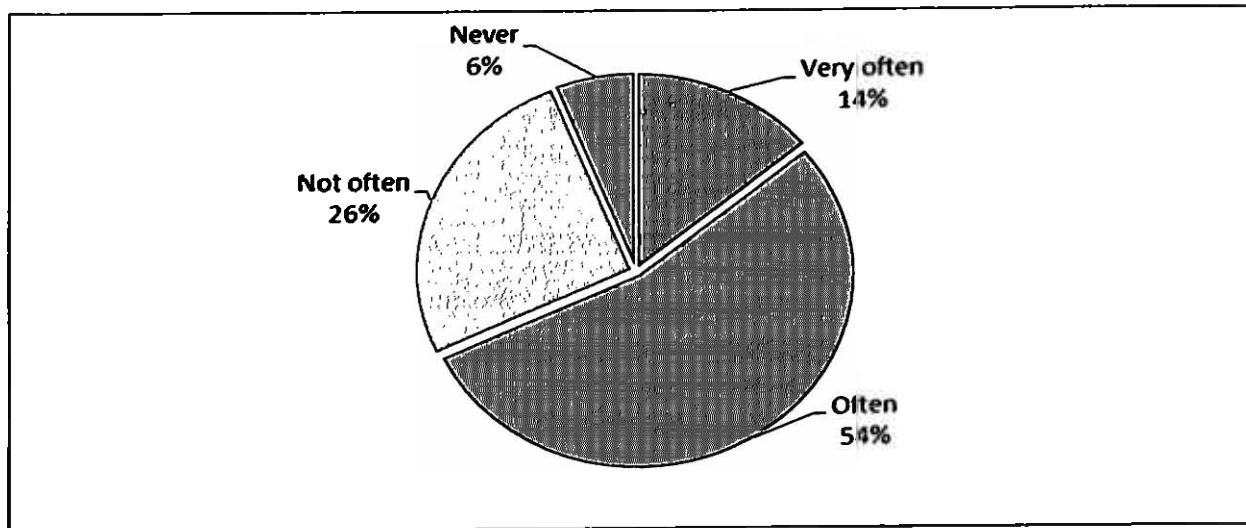
when faced with challenges. Children benefit from partaking in "nontraditional thinking and method of problem solving" (Expect the Best from a Girl. That's what you'll Get.). Parents can encourage this by supporting children in an environment in which they use their minds, bodies, and tools to accomplish a task. Finally, parents should model critiquing the media. Parents should model critical thinking and critiquing of sources of information whether they are in print, on the radio, or on the Internet. Parents should also discuss how males and females are portrayed in music, television, magazines, etc. Having these discussions provide wonderful opportunities to share expectations and beliefs. Parents are crucial in shaping the attitudes and perspective of children toward technology.

Table: 4.4 Time during the day that students had access to computers

	Frequency	Percent
Break/ lunch time	58	49.2
In between lesson	35	29.7
During weekends	25	21.2
Total	118	100

At school most students used the computers during break time or lunch time as shown by 49.2% of the students, 29.7% used computers in between lessons while 21.2% used computers during weekends.

Figure: 4.5 Frequency of using computer at school or home



Source: Researcher, 2011

4.2 Effects of computer in learning enhancement

The students gave insights on how use of computers had enhanced their learning. The students concurred that the introduction of computer use in their schools had created great motivation in their learning. They posited that one of the major benefits achieved through introduction of computers was a better understanding of various subjects that they were being taught. The research further established that students' discipline had improved as they were occupied for the better part of day and they did not have time to engage in delinquent behaviors. The parents of students indicated the class had improved in academics and discipline through what he had observed among the children.

Parents can be positive influences with computer use equity in technology at school as well as at home. The previously mentioned ideas and suggestions can be strengthened in the school setting. Mothers can be involved in school by being teachers' aides in computer labs (Closing the Computer use Gap: Computer use Gaps Fact Sheet, 1997). In addition to being role models in the home, mothers can be role models at school. They can offer to be guest speakers or mentors for their own daughters or others' daughters. Parents can also get involved in school on the administrative level (Expect the Best from a Girl. That's what you'll Get.). Parents can narrow

the computer use gap by being volunteers for clubs or other student groups such as computer clubs. Parents can be a part of technology committees, the Parent Teacher Committee of the school, or other decision making committees which determine how to spend funds raised. Being a part of the team making appropriate technology purchases and discussing technology/computer use issues of both girls and boys. This will benefit all students (Closing the Computer use Gap: Computer use Gaps Fact Sheet, 1997). Parents can be powerful advocates for their children at the school.

While parents have the greatest ability to influence their children, those involved in the educational system have the capacity to play great roles in narrowing the computer use gap as well. Those in administrative positions within school and outside school have both money and influence with which to express their priorities. Administrations have the potential to be a powerful starting point for computer use equity.

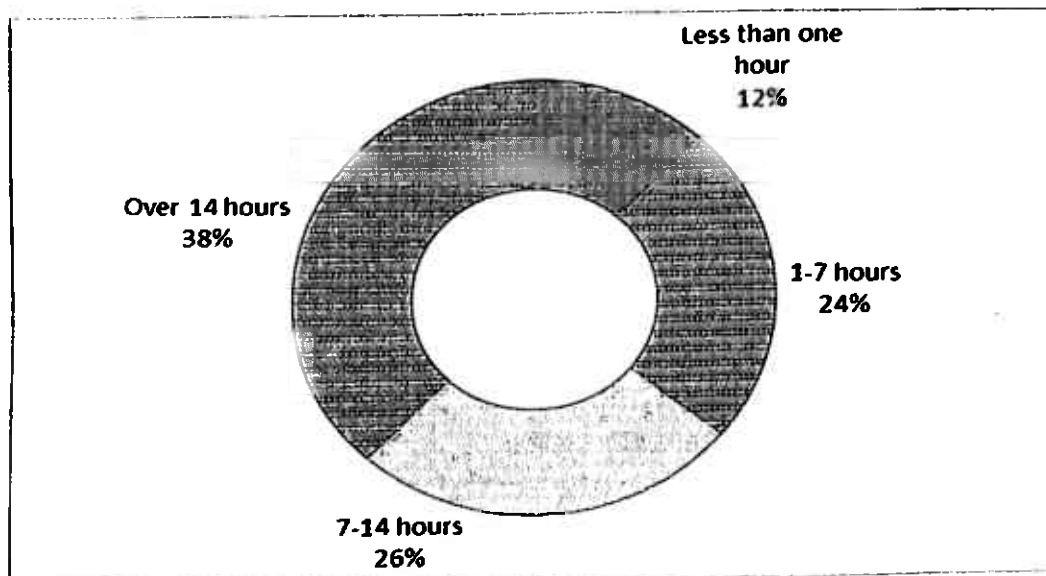
Though only a few suggestions are included here, there are endless possibilities for what can be done on the administrative level to narrow the computer use gap. Administrations should put policies in place that ensure equal exposure to technology for all students (Closing the Computer use Gap: Computer use Gaps Fact Sheet, 1997). This assumption was collaborated by two of the key informants –The school head teacher and the Provincial Director of Education (PDE)

Conversely, research shows that often times children are neither called on, nor offer answers to these questions. Fifth, teachers should review educational materialism, especially technology, for stereotyping and computer use bias (Horizons, 1998). While individual teachers rarely have the authority to make curriculum alterations, issues raised by these materials can be extremely valuable learning experiences for students. Helpful tips for evaluating web sites for computer use bias can be found on [web evaluation site](#). A sixth and final suggestion to teachers is to encourage a cooperative learning environment (Technology Computer use Gap Develops While Gaps in Math and Science Narrow, 1998). Team work and cooperation is beneficial to female students. Children are often more comfortable sharing in small groups, and they often do not work as productively in competitive environments. There is much that teachers can do in the classroom to encourage females to reach their potential thus empowering them to see themselves as equals in computer use and beyond.

A third major influence on children in the use of technology is manufacturers of software and Internet services. It is first important to see how children and boys see computers differently. Then, it is valuable to look at what children want to see in software and the Internet. Technology products and services have an important role to play in the attitudes of children toward technology.

Children and especially boys have a tendency to view computers differently. "Children tend to see computers as a means of achieving a concrete goal. Children are likely to conceptualize computers as a tool, be it for email or word processing, but still a medium with which to accomplish a task" (Chaika, 1999). Software designed specifically for children tends to be a learning tool. According to research of Grunner, "Women, commonly saw technological instruments as people connectors, communications and collaborations devices" (Grunner, et. al., 1990). Yet again, it can be seen that women look at computers as instruments to complete a task. To the contrary, boys usually view computers as recreational (Gaicquinta, et. al., 1990). They see them as toys to be played with and explored. Thus boys explore, challenge the limits, and often shape computers and computer use. Computers are viewed differently by males and females.

Figure: 4.6 Number of hours of computer use per week



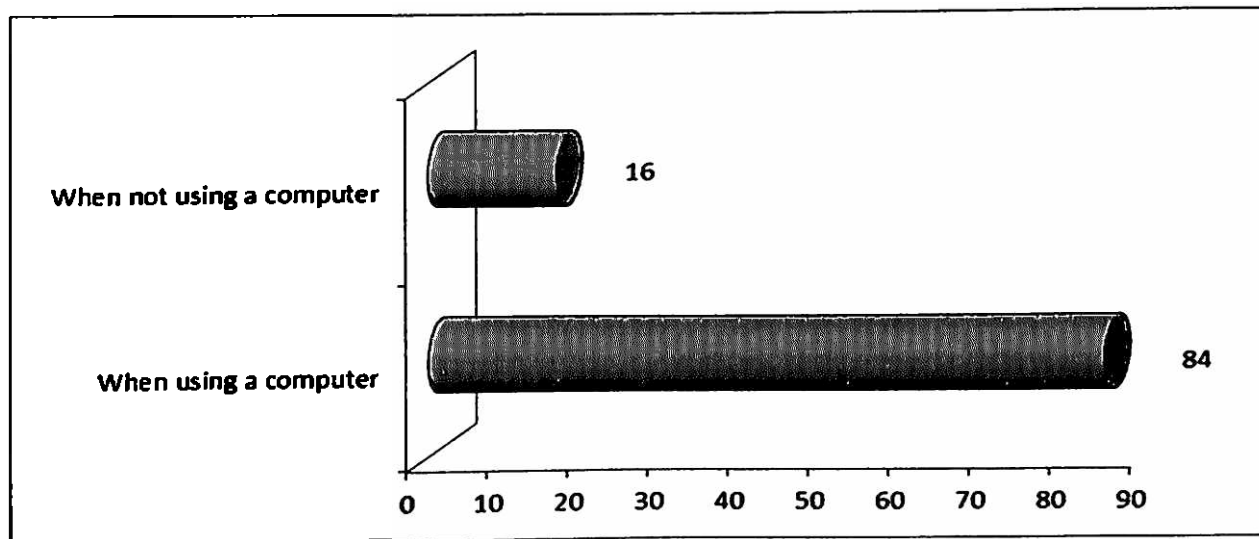
Source: Researcher, 2011

Most of the students used computer for over 14 hours a week comprising 38 percent while 26 percent used computers used computers for 7 to 14 hours. 24% used computers for 1-7 hours a week. However, most students cited they were regularly not given assignments on a weekly basis by their teachers. Further, the teachers used computers while teaching rarely.

The students cited that their teachers used computers during computer lessons, while marking exams, while explaining diagrammatic lessons and for typing classroom data.

All students should have equal accessibility regardless of sex, race, socioeconomic background, or disability. School administration can also be responsible for educating the teachers in computer use issues (Closing the Computer use Gap: Computer use Gaps Fact Sheet, 1997). It is important for teachers to be informed of innovations in classroom management plans and teaching strategies which are fair and equitable to all students. Teachers also need to be knowledgeable about guidelines and policies within their area. In addition, the administration should ensure that teachers are educated on reviews and evaluations regarding computer use issues. The administration should also be responsible for investigating possible alternative classrooms (Horizons, 1998). Such alternatives include single-sex classrooms; active recruiting of females for typically low-female enrollment courses, studying the schools' class schedules to discourage conflicts between classes which are typically female or male dominated. There is much that can be done on the administrative level to encourage computer use equity in computer use and accessibility.

Figure: 4.7 Time students claim they understand their teacher well



Source: Researcher, 2011

Most students agreed that they understood their teachers most when they used computers comprising 84% while 16% disagreed. As disclosed by the students, use of computers was instrumental in making them understand social studies, mathematics and science subjects among other subjects. This is owing to the fact that the computers gave those many graphical illustrations and that they were conversant on how to use computers to conduct calculations.

The administration of a school district is powerless to make a difference for children in technology without the help of teachers. Next to parents, teachers are extremely influential on the attitudes and perceptions of the children. Several sources suggested that teachers look at teaching strategies, the most comprehensive list came from the Midwest Desegregation Assistance Center in its online report in Horizons (Horizons, 1998). While few suggestions deal directly with technology, they indirectly influence children as their self images are being formed. Just as subtle words and actions of parents send messages, so, too, the words and subtle actions of teachers send messages. First, teachers should make sure they are dealing with infractions of the discipline policy equally (Expect the Best from a Girl. That's what you'll Get.). Boys and girls should be treated the same whether the incident involves a fight on the school grounds, threats, or other means of breaking school rules. Secondly, teachers should refrain from pitting girls

against boys in class. This leads to name calling and stereotyping. A third suggestion is to equally praise boys and girls for intellectual skills (Horizons. 1998). Boys tend to receive more praise for these skills while girls tend to be praised for social skills such as team work and compromising. Fourth, students should be called on equally to answer higher level questions (Technology Computer use Gap Develops While Gaps in Math and Science Narrow. 1998). Again, boys tend to be asked these questions, and they tend to offer answers more frequently to these questions.

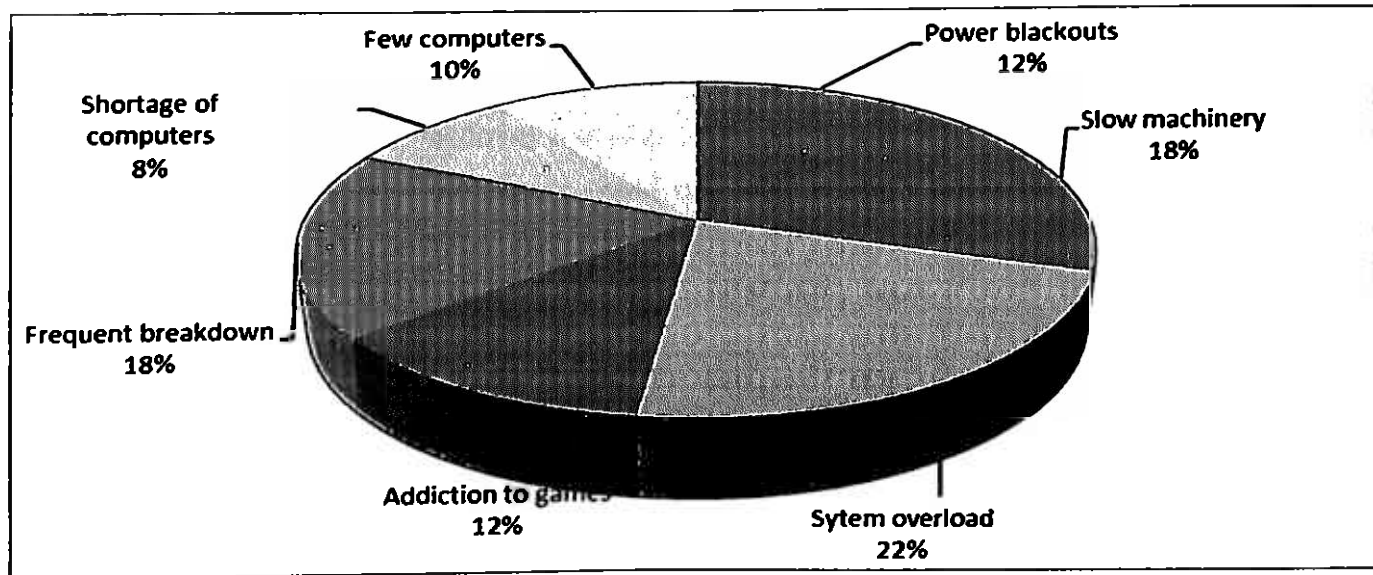
Table: 4.5 Whether the students feel motivated when examples are given through computer

	Frequency	Percent
Yes	98	83
No	20	17
Total	118	100

Source: Researcher, 2011

Most of the students felt motivated when examples were given through computer comprising 83 percent while 17 percent were not motivated when examples were given through computer. The students clarified that through computers they observed many practical aspects of what was taught by their teachers as demonstrated by the teachers.

Figure: 4.8 Challenges of using computers in learning



Source: Researcher, 2011

The students cited various challenges of using computers in learning and these were system overloads (22%), addiction to games (12%), slow machinery (18%), power blackouts (12%), frequent breakdown (18%) and few computers (10%).

The researcher further sought the clarification on various challenges that the students had indicated. According to the findings the students indicated that the system overloads were caused by small capacity of storage of most of computers. This made the computers less effective.

The addiction to games among the students was a common phenomenon. The students posited that they spent much of their quality time playing computer games both while at home and in school. This deprived them time to do their assignments and revise for the exams thus affected their performance in school. This was tackled by strict timeline in the daily time tables.

The students further concurred that most of the computers that they used in school were old models whose speed was very low thus they tended to be very slow in operation.

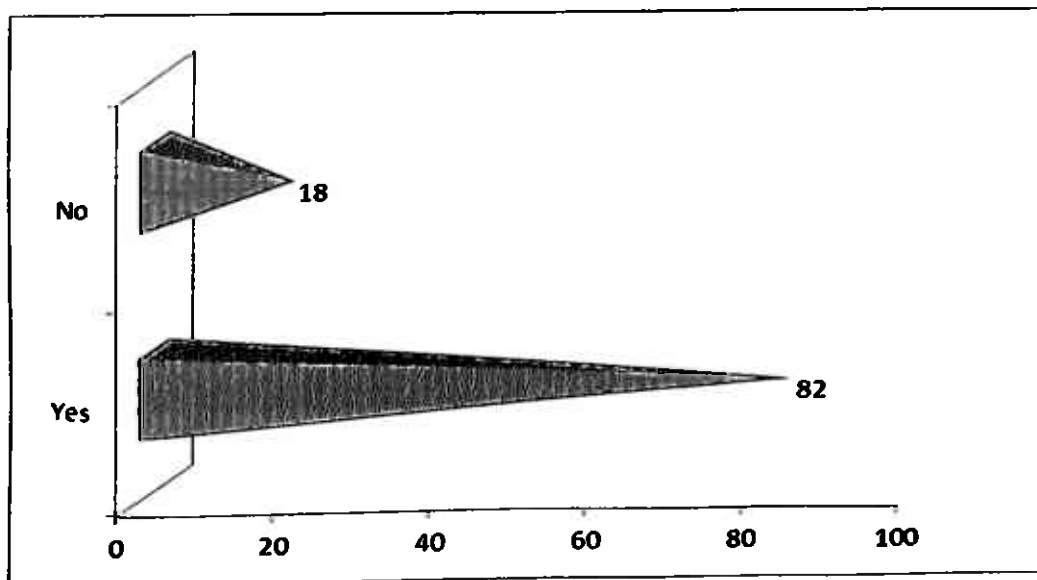
Power blackout was another challenge that affected computer use. The students informed that this challenge was compounded by the fact that their schools did not have power backups and that they had to wait until power resumed.

The challenge of frequent breakdown was also very common in schools. The schools' computers were of poor quality since the schools could not raise enough funds to purchase high quality computers. In addition the schools did not have trained personnel to repair the computers every time they broke down. This situation was addressed by the school

by outsourcing the skilled labour to fix the computer this was indicated by the school's computer teacher.

The student disclosed that there were very few computers which had to be shared among very many users. This is owing to the fact that the schools could not raise enough funds to purchase enough computers for all the students.

Figure: 4.9 Whether computers enhance teaching



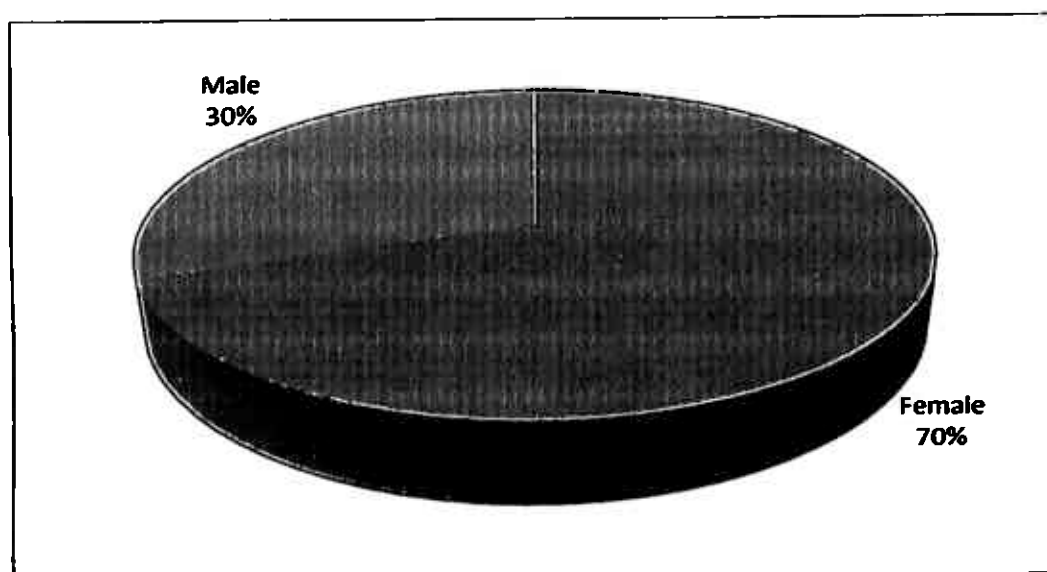
Source: Researcher, 2011

Most respondents agreed that computers enhance teaching comprising 82 percent while only 18% disagreed. The students cited that computers offered easier explanations, relevant

information, many sources of information and learning different subjects on their own. The research revealed that use of computers made teaching very interesting as the teacher could demonstrate what they taught using photos downloaded from the internet. The teacher's instruction could be easily followed by very many students in a class.

4.3 Teacher responses

Figure: 4.10 Computer use



Source: Researcher, 2011

Most of the teachers were female comprising 60 percent while male teachers comprised 40 percent. This depicts that the rate of use of computers in schools was slow because more males are computer literate than their female counterparts, yet there were more female teachers.

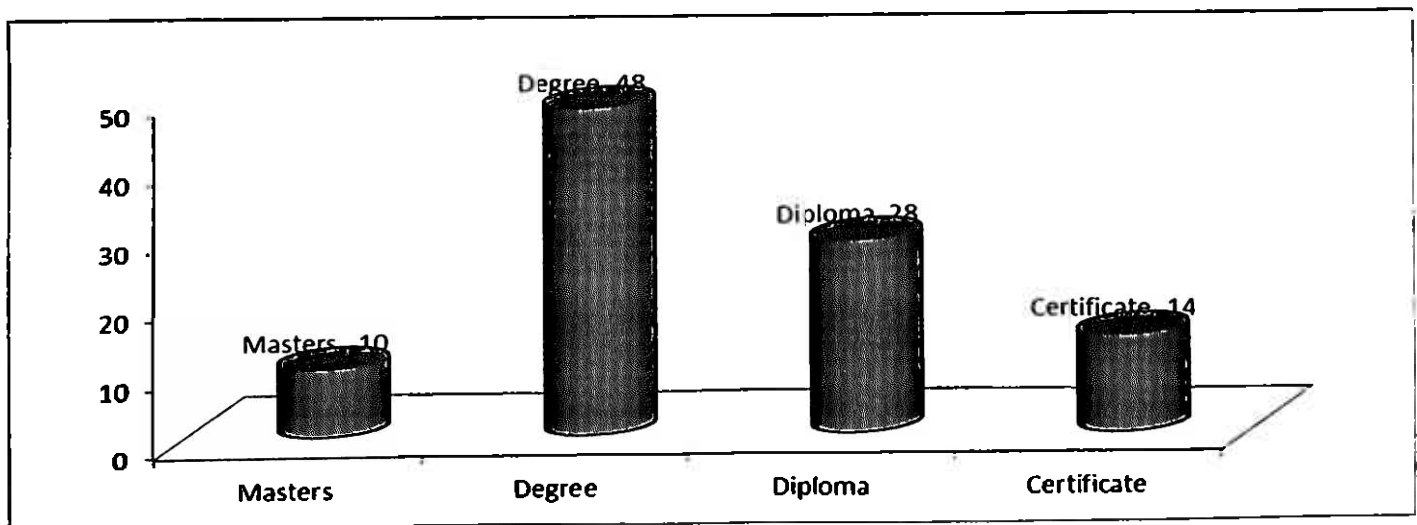
Table: 4.6 Age bracket

	Frequency	Percentage
Under 30 yrs	2	17
Over 50 years	4	33
30-50	6	50
Total	12	100

Source: Researcher, 2011

Most teachers were aged between 30-50 years comprising 50% while 33 percent were aged over 50 years. Only 17 percent were aged under 30 years.

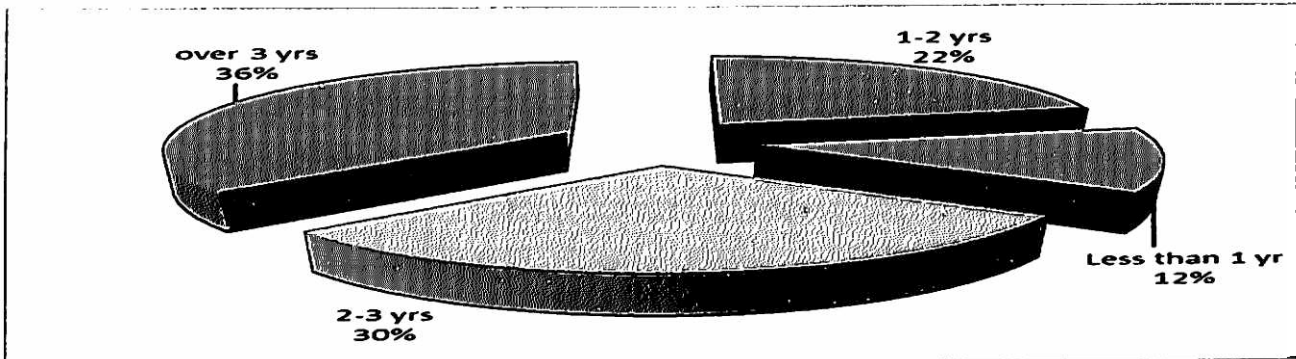
Figure: 4.11. Highest qualification attained



Source: Researcher, 2011

Most of the teachers had degree level of education comprising 48 percent while 28 percent had diploma level of education. 14 percent had certificate level of education. 10 percent had masters level of education. This illustrates that the teachers were highly learned and were well conversant with ICT skills acquired in their training. This sample was obtained through purposive sampling hence majority of teachers interviewed had sought higher Education.

Figure: 4.12 Number of years teaching



Source: Researcher, 2011

Majority of the teachers had over 3 years experience comprising 36% while 30% had 2-3 years experience. 22 percent had 1-2 years experience. 12 percent had less than one year experience. This points to the fact that majority of the teachers were highly experienced, owing to the many years of teaching and thus could learn more on use computers to deliver teaching content to their students appropriately. The majority of teachers retaliated that the use of computers in classroom instruction in any way could not replace the role of teachers. This helped to dispel the notion and fear among other teachers that computers will send them to early retirement.

Majority of the teachers agreed that they had access to computer both at school and at home. Further, most teachers used computers at school in classrooms (lab tops and projectors) and in the computer laboratory. The teachers also agreed that they gave their assignments to their students to use computers.

Table: 4.7 Frequency of using computer for school work related to the various purposes

Purpose	Very often	Often	Rarely	Very rarely
Teaching specific subjects	64%	34%	2%	
Learning specific subjects	54%	14%	28%	4%
Finding and accessing educational materials	76%	24%		
Preparing lessons	12%	10%	68%	10%
Communicating with pupils	8%	24%	56%	12%
Communicating with parents	2%	10%	78%	10%
Keeping track of student performance	44%	24%	28%	4%

Source: Researcher, 2011

Most teachers agreed that they very often used computers for finding and accessing educational materials, learning specific subjects and teaching specific subjects comprising 76%, 64% and 54% respectively. However, they rarely used computers to communicate with parents and for preparing lessons as was shown by 78% and 68% each. One teacher indicated that the installation of Encarta Software had made her work easy, that is by retrieving content from Encarta premium, Encarta kids and Encarta Dictionary has been made easy.

The use of computers had led to various changes that the teachers had seen in their pupils which can be attributed to usage of computers and this included improved performance and better

understanding by the students. Among the changes included increased enrollment rates of students, high retention rates and high completion rates of the students. Other improvements realized through use of computers in schools were better grades, high students' motivation, higher class attendance or better handling of home-work. The school further improved on the provincial public schools ranking by being ranked the first position in Nairobi province in the year 2010 compared to the 3rd position in the year 2009.

The study revealed that most students typically used computers in the computer laboratory during specific hours that was clearly indicated in the timetables. There were various software that were available for student use in the classroom or lab such as Microsoft office, video through discovery channel tutorials, Internet explorer and Encarta software. ICT has had a big impact on learning and the general use of technology in the school. It had led to various changes such as accessibility of information, better explaining of charts and diagrams and wider knowledge base. The children are highly motivated and can find more learning materials as guided by the teachers

Among the various barriers that had been encountered in trying to implement introduction of technology in the School were shortage of enough computers, frequent breakdown, system overloads, addiction to games, lack of help supervising children when using computers, lack of financial support slow machinery and power blackouts.

4.4 Role of stakeholders in primary school in enhancing use of ICT

Parents can enhance teaching using computers through facilitating funds to support ICT development in schools. Further, the parents need to advice their children to put more effort in learning ICT with computers and internet. The Nairobi primary school principal advised that teachers can enhance teaching using computers through acquiring ICT skills in order to teach the children in classrooms. He said teachers' further need to lay emphasis that computer lessons are attended by all children .As indicated by the key informants, use of computers had more benefits to church sponsored schools and private schools than the public schools. Among the reasons they highlighted were the financial resources of church sponsored schools and private schools were better managed thus their ICT systems was fully integrated in their schools. They also disclosed

that majority of their students were already computer literate while they joined this institutions thus it was very easy to teach them using computers. On the other hand. the research in Nairobi primary- which is public- established that among the few public schools that had computers, the students were catching up with their counterparts in church sponsored schools and private schools. This is evidenced by the Improvement of the school's position from position 3 in the province then. to claim position 1 in the now Nairobi County among the public schools in the Kenya Certificate of Primary Education (K.C.P.E) . The teachers indicated that the school programmes of public schools were more flexible thus the students had enough time to learn using computers. The results were evident from the exams that the students sat in where students from public and private schools competed favourably.

Another key informant P.D.E Nairobi (Provincial Director of Education) further posited that the Government needs to allocate funding via constituency and district offices to help fund ICT projects in primary schools, it also need to have more ICT hubs in at least all counties to start with and then roll out to the Counties and educational Zones all over the country. This is in line with Sessional Paper No.5 of 2005 which Cleary stipulates the need of use of ICT in primary schools to close the knowledge gap and also at some extent bridge the teacher shortage.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECCOMENDATIONS

5.1 Summary

The study revealed that a majority of the students were female comprising 56% while 44% were male. Most students lived with both parents (46%) while 24% lived with a guardian. 18 percent lived with a single mother parent with 6% living with their brothers and sisters. Most of the students' parents were employed comprising 83% while 17% of the student's parents were not employed. Majority of the parents were in formal sector. The study established that boys were more conversant with computer use than girls thus had a competitive edge on subjects taught with computers.

The study established that most of the students use computers in computer laboratories comprising 78 percent while 12 percent used computers in other areas. 10 percent used computers in the classroom. Majority of the students did not have a computer and none of the students carried a computer to school. Further, most students used computers at home to surf on net (36%) while 30% used computers at home to complete assignments. 22 percent used computers at home to play games. At school most students used the computers during break time or lunch time. From the findings, the research identified that the students used computers in the computer laboratory.

On the issue of the frequency of using computer at school or home, most students used Computers often as was shown by 54% while 26% did not often use computers. 14% very often used computers. Majority of the students cited their usage of computers had increased the current year compared to the last years. On the effects of computer in learning enhancement, majority of the students agreed that there had been a great difference in learning because of use of computers and this had led to their advancement in learning by use computers. Particularly, most students had improved in areas such as science, mathematics and social studies. However, the students did not frequently use computer to communicate with their teachers. Most of the students used computer for over 14 hours a week a good number used computers used computers for 7 to 14

hours. However, most students cited they were regularly not given assignments on a weekly basis by their teachers. Further, the teachers used computers while teaching not very regularly.

Most students cited that their teachers used computers during computer lessons, while marking exams, while explaining diagrammatic lessons and for typing classroom data. Further, most students agreed that they understood their teachers well when they used computers comprising 84% while 16% disagreed. In addition, most of the students felt motivated when examples were given through computer comprising 83 percent while 17 percent were not motivated when examples were given through use computer.

On the area of the various challenges of using computers in learning, the respondents cited system overloads (22%), addiction to games (12%), slow machinery (18%), power blackouts (12%), frequent breakdown (18%) and few computers (10%). However, most respondents agreed that computers enhance teaching comprising 82 percent while only 18% disagreed. The students cited that computers offered easier explanations, relevant information, wide sources of information and learning different subjects on their own.

On the area of teacher responses, most of the teachers were female comprising 60 percent while male teachers comprised 40 percent. Further, most teachers were aged between 30-50 years comprising 50% while 33 percent were aged over 50 years. Only 17 percent were aged under 30 years. In addition, most of the teachers had degree level of education comprising 48 percent while 28 percent had diploma level of education. 14 percent had certificate level of education. 10 percent had masters level of education. Majority of the teachers had over 3 years experience comprising 36% while 30% had 2-3 years experience. 22 percent had 1-2 years experience. 12 percent had less than one year experience.

Majority of the teachers agreed that they had access to computer both at school and at home. Further, most teachers used computers at school in the staff room, classrooms and in the computer library. The teachers also agreed that they gave their assignments to their students to use computers. In addition, the teachers used computers to teach students for 2- 8 hours per week. Most teachers agreed that they very often used computers for finding and accessing educational materials, learning specific subjects and teaching specific subjects comprising 76%,

64% and 54% respectively. However, they rarely used computers to communicate with parents and for preparing lessons as was shown by 78% and 68% each. The use of computers had led to various changes that the teachers had seen in their pupils which can be attributed to usage of computers and this included increased performance and better understanding by the students.

5.2 Conclusion

The study concludes that the use of computers had led to various changes that the teachers had seen in their pupils which can be attributed to usage of computers and this included increased performance and better understanding by the students. The students cited that computers offered easier explanations, relevant information, many sources of information and learning different subjects on their own. In schools where there have been introduction of use computers for learning, there have also been improvement of grades, motivation and discipline in classrooms. This is attributed by the fact that computers have the potential to change schools so that learning in them is more student-centered and collaborative and more successful in terms of outcomes.

The study further concludes that there were various challenges in the use of computers and these included system overloads, addiction to computer games, lack of help in supervising children when using computers, unavailability of computers, lack of financial support, slow machinery, power blackouts, frequent breakdown and few computers. Well-designed software can provide prompts after a number of attempts by the student, and automatically offer higher levels of challenge by monitoring patterns of answers inputted by the student. She further notes, these navigational aids and self-paced learning features give students independence in their learning and helps them stay on task.

The research concluded that for the school to accrue the many benefits of using of computers to enhance teaching and learning among the students; the school management should fully support this initiative. This would be evident through allocation of enough financial resources to implement this initiative. The school management should also put in place a school policy to guide the implementation of this programme in the school. The schools are to gain benefits of using computers in teaching mainly the social studies science and mathematics subjects among other subjects. To enhance teaching and students learning using computes the schools should consider either hiring or outsourcing qualified IT personnel to ensure that the hardware and the software are well maintained and to spearhead the ICT integration process in the schools.

5.3 Recommendations

The study recommends that there is need to increase the normal computer use in the schools. Further, there is need to establish a curriculum that can be used together with the computers.

The study further recommends that parents can enhance teaching using computers through facilitating funds to support ICT development in schools. Further, they need to advice their children to put effort in learning with the use computers and internet.

The study recommends that teachers can enhance teaching using computers through acquiring ICT skills in order to reach the children in classrooms. The teachers further need to lay emphasis that computer classes are attended by all children.

Further, the study recommends that the Government needs to allocate funding via constituency development fund to help fund ICT projects in primary schools among other project since ICT is the driver to the realization of vision 2030.

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APPENDIX 1: STUDENT QUESTIONNAIRE

1. CODE: _____

2. CLASS: _____

3. SEX: 1. Male 2. Female

4. Year of birth _____

Age _____

5. Who do you live with?

- 1) Both parents 2) Single parent (mother) 3) single parent (father)
4) Guardian 5) Brothers and sisters 6) Relatives (tick one)

6. Is your parent employed? 1) Yes 2) No

7. is your parent in informal sector or formal? 1) Formal 2) Informal

8. Do you have a computer? 1) Yes 2) no

9. If yes do you come with it in school? 1) 2)

10. Is it your computer or your parent computer?

- 1) My computer 2) Parent's computer 3) my brother or sister computer

11. How many years have you been using computer?

- 1) Less than 2 years 2) 2 years 3) 3 years
4) Over 3 years

12. At home do usually use computer?

- 1) Yes 2) No

13. If yes, what do you do with computer when you are at home?

- 1) Playing games 2) Watching children programs
3.) Completing assignment 4) surfing on the net

14. From the time you got a computer have you been able to use it effectively?

- 1) Yes 2) No

15. Do you usually use computer while at school?

- 1) Yes 2) No

16. If yes, when do you usually use computer at school?

- 1) While doing my assignment 2) During break time or lunch time
3) Other specify _____

17. How often do you use computer both at home and school per week?

- 1) Very often 2) Often 3) Not often
4) Never

18. In your last year, was your usage of computer the same as today?

- 1) Yes 2) No

19. If yes when were you using computer more often?

- 1) This year 2) Last year 3) It is the same

EFFECTS OF COMPUTER IN LEARNING ENHANCEMENT

20. Is there difference in your learning because of use of computers?

- 1) Yes 2) No

21. Can you attribute your advancement in learning to computer?

- 1) Yes 2) No

22. Between today and last year when can you see improvement because of use of computers?

- 1) Today 2) Last year

23. In which area have you improved because of using computers?

- 1) Mathematics 2) Languages 3) social science

24. How often do you use computer to communicate with your friends?

- 1) Very often 2) often 3) Rarely
4) Very rarely 5) Never

25. Who do you often use computer to communicate with?

- 1) Teacher 2) Relative 3) brother or a sister
4) Parents

26. Do you usually use computer to communicate with your teacher?

- 1) Yes 2) No

27. What do you usually communicate with your teacher?

1) Asking for assignment 2) just greetings

3) Specify _____

28. How many hours do you use computer per week?

1) Less than one hour 2) 1-7 hours

3) 7-14 hours 4) Over 14 hours

29. How many assignments which are given by your teacher per week which you usually use computer?

1) None 2) 1-7 3) 8-14 4) Over 14 time

30. How many teachers who usually give out assignment which a pupil is required to use computer?

1) None 2) One 3) Two

4) Three 5) Over three teachers

31. Do your teacher use computer while teaching?

1) Yes 2) No

32. Does he/she use computer in all periods?

1) Yes 2) NO

33. If no. at what does your teacher usually uses computer?

1) While giving us a solution to a problem 2) When we are starting a new lesson

3) While doing revision 4) other
specify _____

34. At what time can you claim that you understand your teacher well?

1) When using computer 2) When he/she is not using computer

35. Do you feel motivated when examples are given through computer?

1) Yes 2) No

36. What are challenges of using computers in learning _____?

37. Do you think that computer enhance teaching?

1) Yes 2) No

38. Do you think that computer enhance teaching?

1. Yes 2) No

APPENDIX 2: TEACHERS' QUESTIONNAIRE

1. Name (optional) _____

2. Computer use 1) Male 2) Female

3. Age 1) Under 30 yrs 2) 30-50

3) Over 50 years

4. What is your highest qualification attained?

1) PhD 2) Masters 3) Degree 4) Diploma

5) Certificate.

5. How many years have you been teaching?

1) Less than 1 yr 2) 1-2 yrs

3) 2-3 yrs 4) over 3 yrs

6. What subjects have you been teaching (specify)

7. How many years have you been using computers and internet in teaching?

1) Less than 2 yrs 2) more than two 6 yrs.

8. Do you have your own computer?

1) Yes 2) No

9. Do you have access to computer at school?

1) yes 2 No

10. Do you have access to computer at home?

1. Yes. 2 No

11. Where do you use computer in school?

1) In staffroom 2) Computer lab 3) classroom

4) Library

12. Do give assignment to your students to use computer

1) Yes 2) No

13. Do your students send their completed assignments via internet?

1) Yes 2) No

14. Does your student send their completed assignments via internet?

1 Yes 2) No

15. How many hours do you usually use computer per week in teaching?

1 less than two hours 2) 2-8 hrs 3) over 8 hrs.

16. How often do you use computer for your school work related to the following purposes?

Purpose	Very often	Often	Rarely	Very rarely
Teaching specific subjects				
Learning specific subjects				
Finding and accessing educational materials				
Preparing lessons				
Communicating with pupils				
Communicating with parents				
Keeping track of student performance				

17. Do you use computer to access materials for teaching?

1) Yes

2) No

18. What kind of changes have you seen in your pupils which can be attributed to usage of computers? _____

19. Has the use of computers in primary school led to improvement?

1) Yes 2) No

20. Have your student improved because of use of computers

1) Yes 2) No

21. Do you usually give out assignments to your pupils to be done by use of computers?

1) Yes 2) No

22. How often do you usually give out assignments per week?

1) Very often 2) Often 3) Rare

4) Very often 5) Not at all

23. Has the usage of helped in improving your communication with your student especially during holiday?

1) Yes 2) No

24. Does your pupil communicate to you via internet?

1) Yes 2) No

25. What kinds of communication do you usually have (specify)

26. Are there challenges of using computers in primary schools?

1) Yes 2) No

List those challenges _____

APPENDIX 3 KEY INFORMANT GUIDE: PRIVATE SCHOOL OWNERS

1. How do your students typically use lab or classroom computers?
2. What kind of software is available for student use in the classroom or lab?
3. How do students typically use the computers in your school?
4. We're interested in your impressions of how the information technology you have just described has impacted your students' learning. Overall, how have students been impacted by the use of technology in your school?
5. Has the technology been of relevance in your school?
6. What changes could be made to technology in your school which would allow *your students* to benefit more from technology?
7. What barriers have you encountered in trying to implement introduction of technology in the School?
8. What changes would you like to see made in your school with regard to how technology is allocated or structured?
9. What can the stakeholders in primary school do to enhance:
 - a. Parents
 - Teaching using computers
 - Learning by use of computers and internet
 - b. Teachers
 - Teaching using computers
 - Learning by use of computers and internet
 - c. Government
 - Teaching using computers
 - Learning by use of computers and internet

APPENDIX 4 KEY INFORMANT GUIDE: POLICY MAKERS AND COMMUNITY LEADERS

- How has the use of ICT been of use among the primary school pupils
- Do you think that introduction of ICT in primary has been important among the student?
- Is ICT relevant in primary schools?
- Do you think that the government is doing enough to facilitate introduction of ICT in primary school?
- What barriers have you encountered in trying to implement introduction of technology in the School?
- What changes would you like to see made in your school with regard to how technology is allocated or structured?

7. What can the stakeholders in primary school do to enhance;

12. Parents

- Teaching using computers
- Learning by use of computers and internet

13. Teachers

- Teaching using computers
- Learning by use of computers and internet

c. Government

- Teaching using computers
- Learning by use of computers and internet

9. Is there anything else you would like to share?

APPENDIX 5: LETTER TO TEACHERS

Mishael Mose Nyangau.

University of Nairobi.

P.O. Box 30197.

Nairobi.

Dear sir/Madam

Re: Research questionnaire

I am a master of communication student at the University of Nairobi. Professionally, I am a teacher of English at the Nairobi primary school. My research project is assessing the usage of computers in teaching and learning a case study of Nairobi Primary school.

In order to gather data for research, I have prepared a questionnaire to be filled by the teachers. I kindly request your assistance in the academic endeavours by filling the questionnaire.

I would like to emphasize that your responses are extremely valuable to me and I would greatly appreciate your answering all questions. I assure you as a professional colleague, that the data collected here will be held in confidence.

Thanks in advance

Regards

Mishael Mose Nyangau.

APPEDIX 6 LETTER TO STUDENTS' GUARDIANS

Mishael Mose Nyangau,

University of Nairobi,

P.O. Box 30197- 00100

Nairobi.

Email: nyangaumosc@gmail.com

Dear Sir/ Madam,

Re: Research questionnaire

I am a **Master of Art degree in communication studies** student at the University of Nairobi. Professionally, I am a teacher of English at the Nairobi primary school. My research project is assessing the usage of computers in teaching and learning a case study of Nairobi Primary school. In order to gather data for research, I have prepared a questionnaire to be filled by the students. I kindly request your assistance in the academic endeavors by allowing your child to fill the questionnaire at the school.

I would like to emphasize that responses of your child are extremely valuable to me and I would greatly appreciate if you allow your child to take part. I assure you as a professional, that the data collected here will be held in confidence and only for academic purposes.

Thanks in advance

Regards

Mishael Mose Nyangau.

APPENDIX 7 :TIME PLAN

Activity	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
Proposal development						
Approval						
Data collection						
Data analysis/ Project write up						
Project submission						

APPENDIX 8: BUDGET

Proposal development	3,500.00
Stationery	12,700.00
Typing and printing proposal	4,000.00
Photocopy (proposal questions)	1,800.00
Transport	19,000.00
Miscellaneous expenses (15%)	3,300.00
Total	54,300.00