THE INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON EFFICIENCY OF SECONDARY SCHOOL TEACHERS IN KAMPALA DISTRICT

BY

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A RESEARCH REPORT SUBMITTED TO SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTERS DEGREE IN EDUCATION INFORMATION AND COMMUNICATION TECHNOLOGY OF MAKERERE UNIVERSITY

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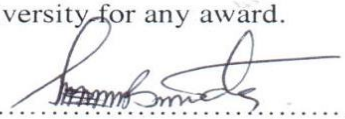
DECLARATION

I Niwagaba Burnet, declare that this is my original work and it has never been submitted to any University for any award.



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Niwagaba Burnet

Date 29/06/2021

APPROVAL

This is to certify that this study "**The Influence of Information and Communication Technology (ICT) on Efficiency of Secondary School Teachers in Kampala District**" has been under my guidance and supervision

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Dr. David Onen
Supervisor

Date 29/08/2021

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TABLE OF CONTENTS

PAGE

LIST OF TABLES

Page

LIST OF FIGURES

Page

LIST OF APPENDICES

Page

LIST OF ACRONYMS AND ABBREVIATIONS

ICT	Information and Communication Technology
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEB	Uganda National Examinations Board
CD-ROM	Computer Diskette Read Only Memory
PCC	Pearson correlation co-efficient
MoES	Ministry Of Education and Sports

ABSTRACT

This study evaluated the influence of Information and Communication Technology (ICT) on efficiency of secondary school teachers in Kampala District. The purpose of this study was to ascertain the influence of accessibility, availability and user-ability of ICT facilities on the efficiency of secondary school teachers in Kampala District with a view of getting ways of raising the efficiency and effectiveness of the teachers in Kampala. The study was guided by three research questions. These sought to find out the different information and communication technology facilities used in different schools, how teachers were using these ICT facilities in teaching and the protocol teachers go through to access the ICT materials and tools. In this study it was hypothesized that availability, accessibility and user-ability of ICTs has a positive effect on teacher's lesson preparation, content delivery and student assessment. Data was collected from a sample of 160 teachers using questionnaires and interviews in which opinions of school administrators and teachers were sought. Inferential statistics were computed using Pearson's correlation co-efficient to show the relationship between availability, accessibility and user-ability of ICT and teacher efficiency.

The study found out that effective use of ICT enhances efficiency and effectiveness of teachers. It was also found out that the use of internet and other ICT based educational resources enriches teaching materials. The study thus concluded that effective use of ICT coupled with continuous refresher courses for teachers would improve content delivery, fasten syllabi coverage as well as easing student assessment which would lead to greater academic achievement. It was also concluded that access to ICT resources have enabled teachers to use them in improving their efficiency in terms of computation of student mark, grades and computerization of student progressive reports. It was recommended that teachers in the training institutions be imbued with the skills and abilities of ICT literacy and sensibilities so that the knowledge and attitude acquired will cascade onto the learners that they come in contact with in the classrooms when they begin to practice.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter contains the background, problem statement, purpose and objectives, research questions, hypotheses, scope and significances of the study.

1.1 Background

Uganda's education system has developed very rapidly in the last decade. This development however is sometimes overlooked by those who are rightly too conscious of how much remains to be done. To such people, the expansion of secondary education has taken place only in quantitative terms. The Kajubi Commission (1989) reports that due to lack of systematic planning, the quality of education offered in most secondary schools in Uganda has not been satisfactory due to the increasing demand for post-primary (secondary) education and the changing priorities within the education sector. The government of Uganda has had to expand secondary education with limited if any empirical evidence about how well it relates to teacher efficiency. Teacher efficiency is one of the key tools in enhancing the education standards of any country. However, ensuring teacher efficiency is a daunting task especially in countries that cannot equip the teachers with the necessary tools for doing their work.

Teacher efficiency is one of the ways through which quality education can be achieved. Teacher efficiency among other things involve good environment, good human resource and above all availability of good instructional materials in visual, printed, projected, graphics,

audio and audio–visual forms. Thus, to ensure quality teaching that enhances quality education, a teacher has to teach with the aid of the mentioned materials (Nacino et al, 1982). In other words, teachers need continued support, facilities and up-to-date instructional materials to ensure their efficiency.

1.1.1 Historical Perspective

Several researchers have over the years attempted to analyze different factors influencing teacher performance and efficiency and similar studies in this field have been carried out in Uganda. However, such studies have mostly been carried out in institutions of higher learning. For instance, Bameka (1996) examined the factors that affect academic staff productivity in public universities in Uganda and found out that levels of education, motivation, use of technology and good pay are among the factors that influence staff performance. While he mentioned ICT as a possible enhancement tool that could be tapped to improve the performance of staff, the influence and role of ICT was not given the exclusive attention it deserves. Besides, the study focused on public universities not on the efficiency of secondary school teachers, a gap that this study intended to fill. Ddungu (2005) and Mugarura (2006) also attempted to analyze the influence of accommodation facilities and institutional factors on teacher productivity in secondary schools in Rakai and Bushenyi Districts respectively. Although they raised very salient ideas on the factors leading to better teacher performance, they paid little attention to the role of ICT in enhancing the efficiency of these teachers. This prompted the need to investigate the influence of ICT on the efficiency of secondary school teachers since the quality of any system of education depends on how well teachers perform their duties.

1.1.2 Theoretical Perspective

The scientific management theory postulated by Taylor (1947) shows how the use of machines can lead to increased production. In his research, Taylor examined the systematic relationship between people and tasks to redesign work for higher efficiency. He found out that the use of machines motivate workers because it simplifies and makes work take shorter time to accomplish which generally enhances performance. Therefore, machines like computers, radios, television, calculators and projectors (ICTs) can lead to improvement and development of workers, teachers inclusive **(See Chapter Two Pg 9).** Thus, ICT is important and can enhance teacher efficiency not only in Kampala District but in Uganda as a whole.

1.1.3 Conceptual Perspective

Information and communication technology (ICT) is a concept that refers to the forms of technology that are used to transmit, store, create, share or exchange information (Merriam, 2002). Wikipedia (1993) defines ICT as a broad subject concerned with technology and other aspects of managing and processing information. Tutor (2008), a global publisher of e-learning, defines ICT as any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. Examples of ICT include radio, internet, television, telephone and the computer. It is believed that how available and accessible ICT is, positively influences teachers' efficiency. Therefore this study focuses on the accessibility, availability and user-ability of the diverse forms of ICT facilities in schools **(See Chapter Two Pg 10).** The ICT considered in this study include: computers, internet,

projectors, databases, and World Wide Web available and accessible to teachers in secondary schools in Kampala District.

Efficiency is the capacity to produce desired results with minimum expenditure of energy, time, money and or material (Pearsall, 1998). It is also the capacity to achieve desired goal/results (Merriam, 2002). Efficiency in this case deals with teacher's ability to use the instructional materials effectively. For the purpose of this study, teacher efficiency will refer to the accomplishment of the objectives and responsibilities of one's appointment; That is, teacher's ability to perform and produce desired results as measured by good student performance. Teacher efficiency was characterized by how well the teachers prepared and delivered lessons, carried out student assessment as well as how much they covered the syllabus. Efficiency is also known to be an observable behaviour from which we make inference about competence of workers, teacher inclusive (Richard, 1995).

1.1.4 **Contextual Perspective**

Many schools in Kampala have for a long time had unsatisfactory academic performance of students at secondary school level. However, teachers have been found not to be effectively teaching and are blamed for failing to provide the best for their students (Education Standard Agency, 2001). Uganda National Examinations Board (UNEB) examiners have been reporting general weaknesses in candidates' practical experience in science subjects and inability of candidates to express themselves clearly. The Board in the recent past reported lack of teaching materials which resulted in candidates' not displaying the expected competencies, difficulty shown by candidates in dealing with higher ability questions (application and analysis), and low levels of competencies in computation skills and graph

work (Bukenya; Daily Monitor Feb 2nd, 2008). All these are attributed to teachers' inefficient work; that is, teacher's failure to cover the syllabus in time, poor student assessment due to inadequate facilities and poor lesson delivery due to limited resource materials. As a result, secondary schools in Kampala like Makerere college school, Kyambogo college school, Lubaga Girl's School, Mengo secondary school, Kibuli secondary school, Lubiri secondary school, Nabisunsa Girl's School, Kawempe Muslim School and Kintante Hill School have embraced the use of ICT in teaching and learning (WorldLinks, 2002). Both private and government aided schools have acquired computers and other ICTs for their schools with the hope that teachers will somehow be facilitated to ensure efficiency and improve the quality of their work. It still remains to be seen as to what extent these ICT facilities have enhanced teachers' efficiency. This study was aimed at investigating the extent to which these ICTs enhanced teacher efficiency.

1.2 Statement of the Problem

The Ministry of Education and every stakeholder in the education sector know the importance of teacher efficiency in lifting the standards of teaching and therefore of learning in any school. However, teachers in Kampala Secondary Schools have been reported to be inefficient in their work (Education Standard Agency, 2001). Most teachers are failing to plan and prepare their lessons adequately many are having poor lesson delivery and assessment methods on top of failing to cover the syllabus (UNEB, 2005). As long as this continues, the standard of education as measured by the academic performance of students at the end of the academic year shall remain poor. Teachers are stack to traditional methods and have failed to harness the potential of ICT in teaching which accounts for their inefficiency. There is therefore need to address this problem of teacher inefficiency in order

to generate viable solutions. This is because teachers are key players in the educational field and therefore need resources in order to teach conscientiously with diligence and perfection if effective teaching is to be guaranteed. While several ideas could be raised to address the scenario, little if any attention has been given to the use of ICT as one of the key factors leading to teacher efficiency.

1.3 Purpose

The purpose of this study was to assess the influence of accessibility, availability and user-ability of ICT facilities on the efficiency of secondary school teachers in Kampala District with a view of trying to get ways of raising the efficiency and effectiveness of the teachers in Kampala secondary schools

1.4 Objectives

The following were the objectives of the study:

i. To establish the effect of ICT availability on the efficiency of secondary school teachers in Kampala District.

ii. To find out the effect of ICT user-ability on the efficiency of secondary school teachers in Kampala District.

iii. To establish the effect of access to ICT on the efficiency of teachers in secondary schools in Kampala District.

1.5 Research questions

The following research questions guided the study;

(i) What is the effect of ICT availability on the efficiency of secondary school teachers in Kampala District?

(ii) What is the effect of ICT user-ability on the efficiency of secondary school teachers in Kampala District?

(iii) How does access to ICT influence the efficiency of secondary school teachers in Kampala District?

1.6 Research hypotheses

In this study, the following hypotheses were tested.

(i) Availability of ICT has a positive effect on the efficiency of secondary teachers in Kampala District.

(ii) Ability to use ICT significantly influences on the efficiency of secondary school teachers in Kampala District

(iii) Accessibility of ICT influences the efficiency of secondary school teachers in Kampala District.

1.7 Scope

This study was conducted in Kampala District covering five Divisions; namely: Kawempe, Central, Nakawa, Lubaga and Makindye. Kampala District has approximately 1000 schools. However this study covered 10 secondary schools including; Makerere College School, Kyambogo College School, Lubaga Girl's School, Mengo Secondary School, Kibuli Secondary School, Lubili Secondary School, Nabisunsa Girl's School, Kawempe Muslim School and Kintante Hill School**.** The study was restricted to these schools where worldlinks/schoolnet Uganda have been operating since 1999 equipping schools and

teachers with ICT tools and ICT literacy, integration and use of ICT tools for instruction and content delivery (World links Uganda, 2002). The study also targeted 100 teachers in a bid to establish the extent to which the introduction and use of ICT had impacted on teachers' content delivery, student assessment and syllabus coverage as factors contributing to efficiency of these secondary school teachers.

1.8 Significance

The study may be of great importance to policy makers and secondary school administrators because it would help to show the major strategies to modify the syllabus to accommodate the application of ICT as a way of enhancing teacher performance in schools. In other words, it would develop an understanding of ICT as an essentials tool for the improvement of education service delivery in Uganda.

The study is also likely to be an invaluable resource for academicians interested in researches on ways in which the efficiency of teachers can be enhanced. The study will also enable students develop collaborative skills as well as knowledge creation skill. In other words it will improve the quality of learning **(See Chapter Two pg 14**).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction:

In this chapter the researcher reviewed the scientific theory of management in relation to ICT and teacher efficiency, developed a conceptual framework and reviewed related literature. The literature was reviewed in accordance with the study objectives.

2.1 Theoretical review

Taylor's scientific management theory explains how workers using machines enhanced productivity in terms of efforts and the direction they take. The theory also explored into how workers apply their efforts and abilities to achieve desired goals. The Scientific management theory by Taylor (1947) determined changes to improve labour productivity. Taylor systematically analyzed the relationship between work and tasks to redesign processes to maximize efficiency. The principal object of the theory was to ensure maximum production by employees through the use of machines. In other words, Taylor identified how the use of machines increased production. Taylor sought to reduce the time a worker spent on each task by optimizing the way the task was done. His suggestion here was likened to the attempt by school administrators to improve on the efficiency and effectiveness of their teachers by providing them with ICT like computers, laptops, projectors, and internet to reduce on the time it would ordinarily take to prepare a lesson and researching for the latest and relevant information **(see Chapter Four pg 47).**

According to Kreitner (2002), Taylor carried out a number of experiments and in all these; his main intention was to increase on workers productivity. In his conclusion, Taylor also believed that provision of adequate work tools correlates with higher efficiency (Mullins, 1999). In the researcher's view when Taylor stated that the "Provision of adequate work tools correlates with higher efficiency", it indicated that school administrators should try to avail appropriate teaching /instructional materials for each class to enable teachers make necessary lesson preparations for effective teaching.

2.2 Conceptual framework

The conceptual model in Figure. 2.1 presents a graphical linkage between ICT and teacher efficiency. This model was based on scientific management theory and was intended to establish the relationship between the independent and dependent variables in the study.

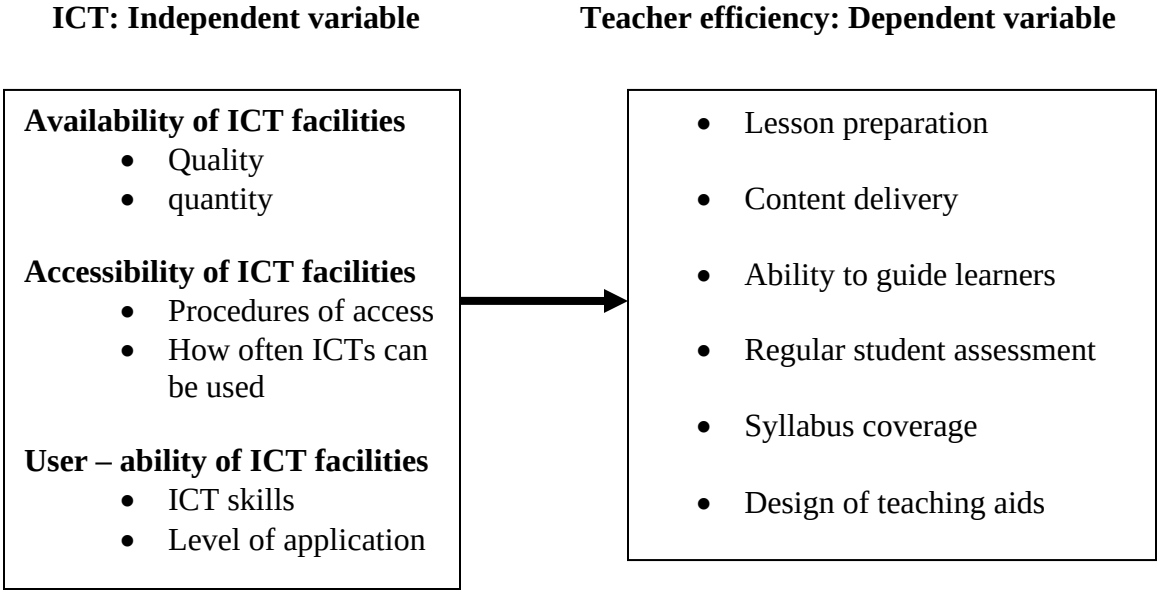

Figure: 2.1 Conceptual Frame work layout.

Source: ***Adapted from Shneiderman and Kearsely (1999; Pg189: Ideas on the influence of ICTs on teaching.***

Figure 2.1 shows the linkage between ICT (the independent variable) and teacher efficiency (dependent variable). In the above model, ICT was conceptualized into availability which was assessed through finding out the quality and quantity of ICT devices for every teacher, accessibility which was gauged by finding out how often and easy it was for teachers to make use of these machines and usability which aimed at measuring teacher ICT skills and their application in the teaching process. Teacher efficiency on the other hand was looked at in terms of how well teachers carried out lesson preparation, content delivery, ability to guide learners, regularity of student assessment, and coverage of syllabus **(See Chapter Four Figure 4.10)**. From this model, it could be argued that teachers with access and ability to use ICT are bound to be more efficient than those who hardly accessed and those who had no skills to use ICT.

2.3 Related literature

2.3.1 Availability of ICT and teacher efficiency in schools

Information and communication technology is important in secondary schools to communicate and carry out research with the global community **(See Chapter Four Figure 4.12).** Before the advent of ICT, teacher efficiency was limited by factors like time and space, the use of manual record keeping systems, a lot of paper work, file occupying a lot of space and risked destruction by insects. However, with the advent of ICT, one can store tremendous volumes of information on diskettes, CD-ROMs and computers, surf a lot of

information on the internet and analyze data very fast and accurately with the help of computers.

Availability of ICT affects the delivery of education and enables wider access to the same. In addition, it increases flexibility so that learners can access the education regardless of time and geographical barriers. It also influences the way students are taught and how they learn **(See Chapter Four Pg 40).** It would enable development of collaborative skills as well as knowledge creation skills. This in turn would better prepare the learners for lifelong learning as well as to join the industry. It can improve the quality of learning and thus contribute to the economy (Tan, 2003).

Similarly, wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching. However there exist some risks and drawbacks with introducing ICT in education which have to be mitigated. Successful implementation of ICT to lead change is more about influencing and empowering teachers and supporting them in their engagement with students in learning rather than acquiring computer skills and obtaining software and equipment (Rovai, 2003).

Availability of ICT has changed the teaching process. The existence of ICT has enabled teachers to transform their teaching practices given a set of enabling conditions. Hence, ICT influences teacher pedagogical practices and reasoning and the nature of teacher ICT use influences students achievement which is a major determinant of teacher efficiency (Somekh and Davis, 1997)

ICT has great potential to enhance teaching, increase efficiency and effectiveness of the education system. ICT open new opportunities for professional development, simplify tasks especially in research, record keeping and the use of library. This is why more schools are embracing the use of ICT. Despite this great potential earlier researchers' into teacher performance had paid little if any attention to the role ICT. For instance Ddungu (2005), Kisembo (1995) and Mugarura (2006) investigated accommodation facilities and teacher's perceptions of institutional factors in relation to teacher performance. Though they raised important issues concerning teacher performance, little attention was paid to the role availability of ICT could play in enhancing teacher efficiency. Besides, these studies were carried out in a different context prompting the need to investigate the extent to which ICT influence teacher efficiency in Kampala District.

2.3.2 ICT user-ability and teacher efficiency in schools

ICT can be used to prepare quizzes and exams for students as form of assessment **(See Chapter Four Figure 4.11)**. Quizzes and exams should be published and be saved in electronic format for possible revision and reuse in future. Studies carried out pointed to the fact that the use of ICT provided quicker and more accurate data collection; saving lesson time and giving quality results hence efficiency (Osbome and Hennessy, 2003). The role of ICT in enhancing teacher assessment can be seen in the emergence of such technologies as handheld computers. Thum (2005) examined computer based assessment and his interest was on the general procedure for measuring teacher or school effectiveness based on assessment. His study however did not consider the role ICT plays in assessment practices of teachers in their day to day practice. Thus there was still room for further investigation, regarding the role of ICT in influencing assessment methods in secondary school in Uganda.

Information and communication technology (ICT) simulations enable teachers to show experiments that would not otherwise be possible. Visual modes of presentation aid understanding of concepts and processes (Trindade, 2002). This means that ICT is powerful in presenting and representing information in different ways. This can be through enabling changes to be shown dynamically such as in mathematical modelling or by helping in visualization of complex process in science (**See Chapter Four pg 40).** This leads to efficient content delivery.

Clarke (2007) explored the use of computer technology in a Caribbean context and tried among other things, to identify factors that secondary teachers considered necessary for successful integration of ICT in mathematics instruction. Trucano (2005) revealed that teachers most often used ICT for routine tasks (record keeping, lesson plan development, information presentation, basic information searches on the internet), but asserts that types of usage of ICT correlate with teacher pedagogical philosophies. He further argued that "teachers who used ICT --- and most effectively --- were less likely to use traditional transmission method pedagogies but tend to practice more 'constructivist' pedagogies". The relevance of these findings to secondary schools in Uganda was a gap to be explored and which merited further study. There was need to find out whether and how ICT increased teacher effectiveness in content delivery in the Ugandan context.

McFarlane and Sakellarious (2002) pointed out that ICT allows teachers to engage and motivate students to greater degree. As a result, mechanical aspects of practical work are reduced allowing students to concentrate on interpreting and analyzing data. Thus the use of

ICT plays a major role in enhancing and extending practical work. Hand held computers for example offer new possibilities for collecting and analyzing data (Newton, 2005). Further more digital videos can be used to capture processes that cannot be seen in real time (McFarlane and Sakellarious, 2002).

Data logging tools record and store measurements electronically. That is they collect data more quickly and accurately, improving the quantity and quality of results. This increased not only flexibility but also efficiency allowing data to be collected outside libraries or over an extended period (Osbome and Hennessy, 2003). Data logging and digital recording allows access to new sources of data in a wider range of experimental settings (Newton, 2000). Thus ICT provides quicker and more accurate data collection saving lesson time and giving quality results hence efficiency **(See Chapter Five pg 57).** Earlier researchers like Mugomba, (2000) centered his study on the out put of academic staff at Makerere University. This particular study delved more into performance of the academic staff in as far as research is concerned no attention was paid to efficiency of secondary school teachers.

2.3.3 Accessibility of ICT and teacher efficiency in schools

Information and communication technology use in the day to day work of teachers increase efficiency in planning and preparation of work due to a more collaborative approach between teachers **(See Chapter Four pg 48).** Teachers using ICT in classrooms do not act in isolation of each other. Thus they have access to resources which would supply ideas and materials for different classroom applications. ICT offers teachers with enhanced resources to support learning through teaching. The levels of interaction, visual quality of resources,

the immediacy, the ability to fresh work and redo it are ways in which ICT can enhance the range of teaching approaches taken thus enhancing teacher efficiency.

Strudler, McKinney and Jones (2005) pointed out that the intention of adopting ICT in schools should not be just for teachers to learn ICT skills but teachers need to explore ways of integrating these skills into their teaching for example when preparing schemes of work and in daily planning for their lessons. While an effective teacher cannot create an extra second of the day, the teacher certainly controls the way time is used. A study by Trucano (2005) revealed that teacher lesson planning is paramount. The study further revealed that where little planning has occurred; student work was often unfocused and could result in low attainment. It was also noted that effective teachers systematically and carefully planed for productive use of instructional time and access to ICT provided a whole host of options for this. The more organized a teacher is, the more effective the teaching and thus the learning is; there are a number of on-line lesson plans that can be accessed and help teachers frame lessons. While this may also apply to Uganda, an empirical study is yet to be done; thus a gap that allowed for further study which this study intended to fill.

Access to ICT enable teachers' to get involved in research and development to support and initiate education innovations which can enhance teaching through expanding the anticipated uses of ICT in education **(See Chapter Four Figure 4.12).** Thus, ICT can improve the quality of teaching in schools and so help raise standards **(See Chapter Five pg 57).** This is why ICT is at the heart of the Ministry of Education of Uganda with commitment to improving quality education. Effective research can only be with the help of new technologies. In this case, secondary school teachers must use ICT to access and use the

updated data. Variety of views can be accessed on internet: computers can be used for organizing, processing and analyzing data very fast and accurately. As such the access to ICT improves the quality of teachers work which leads to teacher efficiency.

Rodrigues (2000) pointed out that information systems and particularly internet based interactive communication technologies and expert systems offered great potentials for accessing evidence-based knowledge. This, according to him, included a possibility of creating, clearing public domain, information materials, resources and an enhanced ability to provide wide spread up to date content. This is because ICT accessibility supports more efficient exchange of information between teachers', professionals thus saving time and resources there by improving teacher effectiveness. Past researchers had attempted to analyze the different factors influencing teacher performance and efficiency. For instance, Bagonza (2006) and Mugarura (2006) raised very salient issues on the factors affecting teacher performance. However, in their studies, nothing was mentioned of ICT as an influential factor hence the need to carry out a study which isolated ICT as factor in influencing teacher efficiency.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter looked at the methods employed in carrying out this study. It presents research design, population of the study, sampling techniques, data collection methods and instruments, data quality control, research procedure and data analysis techniques.

3.1 Design

The study used descriptive research design and was mainly quantitative in nature because variables were measured in numbers and analyzed by statistical procedures due to the nature of problem under investigation (Creswell, 2003). Descriptive approach of data analysis was adapted because it allowed simultaneous description of views, opinions and perceptions at the same time. Besides, it enabled the researcher to obtain a sizeable amount of information about attitudes, opinions, and perceptions of teachers on the influence of ICT on teacher efficiency.

3.2 Population

The study was carried out among secondary school teachers as well as head teachers in Kampala District. Kampala District has approximately 1000 schools according to statistics from the district inspector of schools. However this study focused on 10 schools selected from the five division of Kampala District with 10 teachers randomly selected from each school. The study was restricted to these schools where worldlinks/schoolnet Uganda had

been operating since 1999 equipping schools and teachers with ICT tools and ICT literacy, integration and use of ICT tools for instruction and content delivery (World links Uganda, 2002). It also targeted head teachers in the selected secondary schools. Both graduates and holders of diploma certificates were involved. They were purposely chosen because of their responsibility as educators and the role they played in the application of ICT into teaching.

3.3 Sampling strategies

In this study, purposive and simple random sampling techniques were employed to select the population for the study. Purposive sampling was used to pick head teacher respondents because of their special knowledge and awareness of the theme under investigation and by virtue of their position and role as supervisors in the teaching-learning process. The goal was to select cases that are information rich and the intent was to achieve an in-depth understanding of selected individual sample (Meredith,1996).

Simple random sampling was used to select the teachers because it ensured that equal chances were given for all individuals to be represented. The sample population was stratified and comprised of two groups i.e. head teachers and teachers who were randomly selected from the schools of interest. A total of one hundred and fifty teachers both graduates and diploma holders were randomly sampled in the selected schools in Kampala District. However focus was mainly on graduate teachers' because it has become a Ministry requirement for all secondary school teachers to be graduates accounting for the low population of diploma holders in secondary schools. Seven school administrators (head teachers) were purposely chosen because of being directly responsible for assessing teacher performance from the selected schools in the study area.

Table: 3.1 Summary of details of the sample size

School Name	School administrators (H/M, D/HM)	Teachers	No. of respondents per school
Makerere college	1	08	09
Kyambogo college	1	14	15
Lubaga girls	---	10	10
Mengo s.s.	1	06	07
Kibuli s.s.	---	09	09
Lubili s.s.	1	07	08
Nabisunsa girls	1	16	17
Kawempe Muslim	1	12	13
Kintante Hill	---	10	10
Kololo s.s.	1	08	09
Total No. of respondents	**07**	**100**	**107**

3.4 Data collection methods

To collect the necessary data for the study, the following data collection methods were employed by the researcher:

3.4.1 Secondary method

Here theoretical reviews and studies of related literature using e-resource, use of text books, education policy documents, academic journals as well as previous dissertations constituted bulk data undertaken mainly in the literature. Secondary data collection was prioritised because it is cheaper and quick.

3.4.2 Primary method

This aimed at getting first hand information by contacting respondents' right in the field. This was done by use of questionnaires and interview guides.

3.5 Data collection instruments

To collect the necessary data for the study, the following data collection instruments were employed by the researcher:

3.5.1 *Document analysis*

Documents which contained the information about the subject under investigation were examined. This instrument involved the study of secondary school documents such as text books, Ministry of Education Strategic plan, Education policy documents, information from databases and internet related to ICT. This helped the researcher to get acquainted with the objectives and hypotheses of past researchers so as to formulate those of the present.

3.5.2 Questionnaires

This involved getting primary data from the respondents using pre-determined set of questions designed to collect information on the subject under study. The respondents

included teachers, head teachers, as well as ICT users in the selected schools **(See Appendix A and B).** Therefore self administered questionnaires were employed. The choice of the questionnaire method was justified by the fact that a questionnaire was a single best tool in collection of quantitative data from a big number of respondents (Gay, 1996). Besides, the respondents in the study were generally literate and therefore questionnaires could give relevant and accurate information.

3.5.3 Interview guide

Interviews were conducted with the aid of the interview guide. This was applied to head teachers in order to elicit self report **(See Appendix. C).** The rationale for using the interview guide was to collect qualitative data from head teachers who were taken as overall supervisors of programs at their respective schools, including ICT programs and therefore were deemed more knowledgeable and experienced informants about the use of ICT in teaching at their schools. Interviews were held with head teachers of the 7 secondary schools in order to gain a broader perspective on the schools towards ICT.

3.5 Data quality control

This section was handled in two sub-sections; that is, validity and reliability of the instrument;

3.5.1 Validity of the instruments

To ensure the validity of the research instruments, a draft questionnaire and interview guide were given to the research supervisor and fellow colleagues doing the same course to get their comments on the relevancy, clarity and comprehensiveness of the instruments to

achieve the objectives of the study. This was in line with Jacobs and Razavieh (1990) who contend that validity is answered by having competent colleagues who are familiar with the purpose of the study, and are able to judge the items to find out whether they are adequate for measuring what they are intended to measure or not. The researcher then made necessary adjustments on the study instruments.

3.5.2 Reliability of instruments

To obtain reliability, the researcher conducted a pilot test of the instruments to ensure clarity and suitability of the research instruments. In this study the researcher used 20 respondents to determine the reliability of the instruments. The schools involved in the pilot test included Seta high school, Namilyango girls' school, St Micheal high school, Mukono Bishops and Alliance high school – Nansana. Among the 20 respondents in the study 15 declared the instrument reliable and only five declared the instrument unreliable implying that the instrument is 75% reliable as indicated below;

$$CVI = \frac{\text{Number of respondents who declared the item reliable}}{\text{Total number of respondents}} = \frac{15}{20} = 0.75$$

After the pilot testing, the instruments were amended with the help of the research supervisor. Items found to be irrelevant were dropped and where information was lacking, new items were added. The researcher also made sure that all questions were answered during the pilot study in accordance with Kakinda (2000) who advances that when checking for completeness, the researcher should make sure that there is an answer for each question.

3.6 Research Procedure

A letter of introduction from the East African School Of Higher Education studies and development (EASHESD) was secured **(See Appendix E)**to be granted consent to carry out the study by the administrators of selected schools. Consent was then granted to the researcher by the relevant authorities in all the schools where the study was conducted. The same letter was used to obtain the consent of the respondents for the questionnaires. Questionnaires for teachers were delivered personally to each school. The returned questionnaires were then perused through carefully so that any additional or new information could be taken note of. Finally, observation were made to assess the ICT situation on the ground.

3.7 Data analysis

The study used both quantitative and qualitative data analysis techniques. Percentages were used to analyze quantitative data in order to establish the influence of ICT on teacher efficiency in secondary schools. These percentages helped to show the proportions of the views of various respondents on the influence of ICT on teacher efficiency in secondary schools in Kampala District. Qualitative data was analyzed using content analysis technique. The researcher also used Statistical Package for Social Sciences (SPSS). Pearson product moment correlation was used to test the relationship between ICT and teacher efficiency. It was also used to test hypotheses. The reason for the use of Pearson product moment correlation was because both variables were continuous according to Coombs, 1954.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter presents the results of the study conducted to investigate the influence of ICT on teacher efficiency in Kampala secondary schools. This chapter was divided into three sections: Section **One** is providing data on the availability of ICT and teacher efficiency; Section **Two** reports on ICT usability and teacher efficiency while Section **Three** reports on ICT accessibility and teacher efficiency. Data on various aspects of ICT application in teaching was analyzed both qualitatively and quantitatively. It was presented in form of tables and graphs, objective by objective. However before presenting the data based on the study objectives, the researcher analyzed the characteristics of the study respondents.

4.1 Respondents

These included school administrators and teachers in the selected secondary schools in the study area.

4.1.1 School administrators

Tables 4.1 and 4.2 present data on the gender, qualification and teaching experience of school administrators in the study area. The administrators included head teachers and deputy head teachers.

Table: 4.1 Gender Distribution of school administrators

Gender	Frequency	Percentage
Males	6	86%
Females	1	14%
Total	**7**	**100%**

The findings in Table 4.1 indicate that out of 7 school administrators used in the study, the majority (86%) of the head teachers were males and only 14% of them were females. This was possibly because many parents in Uganda have for a long time preferred to educate the boy child at the expense of the girls which partly explains why the majority of public servants in Uganda are males. It is therefore probable that the population of educated males in the study area was greater than that of females.

Table: 4.2 Distribution of school administrators by Qualification and experience.

Qualification	**Experience in teaching**				**Total**
	10 and below	11-20 years	21-30 years	31-40 years	
Master degree	1 (14%)	2 (29%)	1 (14%)	0	4 (57%)
B.Sc/B.A. Ed	1 (14%)	1 (14%)	1 (14%)	0	3 (43%)
Total	**2 (28%)**	**3 (43%)**	**2 (28%)**	**0**	**7(100%)**

Table 4.2 indicates that head teachers with Masters degree constituted the majority (57%). This is because it is a government policy and a requirement for all secondary school head teachers to have Masters degree. However, 43% had only first degree. With regard to experience, majority of the head teachers (71%) said that they had been in the field of education for more than ten years compared to 29% whose experience in the field of teaching was below ten years. This implies that most head teachers are appointed on the basis of their experience in the education field and this is healthy for ensuring quality education.

Table 4.3; presents data on the designation of school administrators in the study area. The administrators included head teachers and deputy head teachers.

Table: 4.3 Distribution of school administrators by designation

Designation	Frequency	Percentage
Head teacher	4	57%
Deputy	3	43%
Total	**7**	**100%**

Table 4.3 above shows that head teachers constituted 57% and their deputies constituted 43%. This was because the researcher was more interested in head teachers but in schools where the head teacher were absent then, the deputy head teachers were consulted.

4.1.2 Background of teachers

Tables 4.4 and 4.5 present data on the gender, qualification and teaching experience of secondary school teachers in the study area. The teachers studied included heads of departments and subjects teachers.

Table: 4.4 Gender Distribution of teachers

Gender	**Frequency**	**Percentage**
Males	65	65%
Females	35	35%
Total	**100**	**100%**

The findings in Table 4.4 indicate that out of a total of 100 teachers used in this study, 65 (65%) of them were males and 35 (35%) were females. This is possibly because the population of educated males in the study area was higher than that of females. These findings agree with statistical records of the Ministry of Education and Sports (MoES) which indicates that there are more male than female teachers in secondary schools in Uganda. (Ministry of Education and Sports, 2007).

Table: 4.5 Distribution of teachers by Qualification and experience

Qualification	**Experience**				**Total**
	10 and below	11-20 years	21-30 years	31-40 years	
PhD	---	---	1 (1%)	---	1 (1%)
Master degree	3 (3%)	3 (3%)	2 (2%)	1 (1%)	9 (9%)
B.Sc/B.A. Ed	56 (56%)	16 (16%)	1 (1%)	---	73 (73%)
Diploma	12 (12%)	4 (4%)	---	1 (1%)	17 (17%)

Total	**71 (71%)**	**23 (23%)**	**4 (4%)**	**2 (2%)**	**100(100%)**

Teachers with PhD constituted one percent. This can be attributed to the fact that it is not a priority or a government requirement for secondary school teachers to hold PhD degrees. Teachers with Masters degree constituted nine percent while those with Bachelors degree constituted 73%. This is because it has become a government policy for all secondary school teachers to be graduates. This explains why the percentage of diploma holders was low (17%).

Considering the experience of teachers in the study area, the majority (71%) of the teachers indicated that they had been in the teaching profession for less than ten years compared to 29% whose experience in the field of education was above ten years. This implies that appointment of teachers' in schools is not based on ones experience in the teaching field. It also implied that schools in the study area were staffed with fresh brains which is healthy for student academic performance.

4.2 Effect of ICT availability on teacher efficiency

The results obtained from the interviews and the questionnaires in Table 4.6 revealed that various types of ICT tools are used by the teachers for teaching. Through questionnaires and observation checklist for technology in schools, the various ICT resources used at different schools in the teaching process were noted. This was because availability of different ICT facilities was taken as key to effective teaching. In the table, schools were given anonymous names to protect their identity.

Table: 4.6 ICT tools available for teaching and learning at various schools within the study area

ICT tools	**Schools**									
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Internet		---		---		---			---	---
Printers	2	1	1	2	---	1	1	1	1	1
Computers	20	15	20	5	20	5	1	10	2	1
Projectors	1	---	1	---	1	---	1	---	---	---
Microphone/ Speakers	---	---	1	3	2	7	1	---	1	---
Television	2	1	---	---	---	---	3	---	1	---

Radio	---	1	---	---	---	---	1	---	---	---
Video cameras	2	1	1	1	2	1	1	---	---	---
Interactive white board	---	---	---	---	---	---	---	---	---	---
Scanners	2	1	1	---	1	---	1	1	---	1
Photo copier	1	---	--	1	1	1	---	1	---	1
Diskettes	3	1	4	2	3	1	2	2	1	1

Table 4.6 provides a report on audio–visual tools used for teaching and learning at various schools in the study area. Schools had a variety of tools but only 5 had their computers connected to the internet, constituting (50%), 4 schools had projectors (40%), 9 had printers (90%), 4 had Television sets (40%), 2 schools had Radios (20%) and 7 schools had scanners (70%). It can therefore be noted that most schools lacked ICT accessories and peripherals.

While most schools had printers and Video cameras, interactive white boards did not exist in all schools.

The state of computers

There was need to gain data about the state of functionality of the computers in various schools in the study area. The status of computers in these schools was defined in terms of the total number of computers in the school, the number of computers used in teaching and learning and number of faulty computers. The data obtained were presented in Table 4.7.

Table: 4.7 Responses of school administrators on the state of computers at the various schools in the study area

Schools	**Total number of computers**	**Number of computers Used in teaching**	**Number of faulty Computers**
A	20	0 (0%)	0 (0%)
B	15	1 (7%)	2 (13%)
C	20	15 (75%)	5 (25%)
D	5	0 (0%)	0 (0%)
E	20	15 (75%)	0 (0%)
F	5	0 (0%)	3 (60%)
G	1	0 (0%)	0 (0%)
H	3	1 (33%)	0 (0%)
I	2	0 (0%)	1 (50%)
J	1	0 (0%)	0 (0%)
Total	**92**	**32 (35%)**	**10 (11%)**

The findings in Table 4.7 indicate inadequacy of computers in various schools given the high number of students in schools in the study area. Schools **A, C,** and **E** had the highest number of computers (20) while school **G** and **J** had the lowest number (1). It was noted that the low number of computers implied that effective use of computers (ICT) in teaching is not achieved due to the high student - teacher to computer ratio. Apart from the few computers available for teachers' use, 3 schools had some faulty computers and this worsened the problem of inadequate number of computers. School E had the biggest problem with 5 faulty computers out of 20 computers at the school. This is an indication that some schools have problems with computer maintenance.

Figure 4.1 presents data on the responses of secondary school administrators on how often computers in their schools' are available for teachers' use in the teaching and learning process.

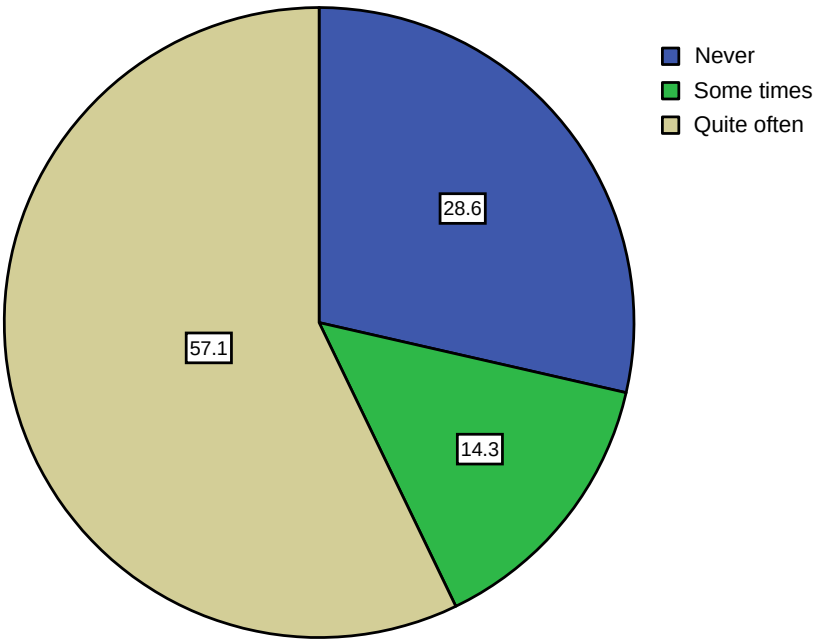

Figure: 4.1 Distribution of Head teachers' responses on the available number of computers for teacher use

Figure 4.1 shows that majority (71%) of the school administrators considered the use of computers in teaching as very important for improving teacher efficiency and so availed computers to their teachers for use. A total of 57% of school administrators indicated that computers are quite often available for teachers' use, 14% indicated that computers are sometimes available for teachers' use while 29% indicated that computers were never available for teachers' use. Unfortunately, not a single administrator out of the 7 administrators used in this study confirmed that computers are always available for teachers' use, an indication that there is still inadequate use of ICT in teaching.

School administrators were also put to task to give information regarding the availability of internet for teachers' use. Figure 4.2 presents the response of school administrators on the availability of internet to enhance teachers' research work.

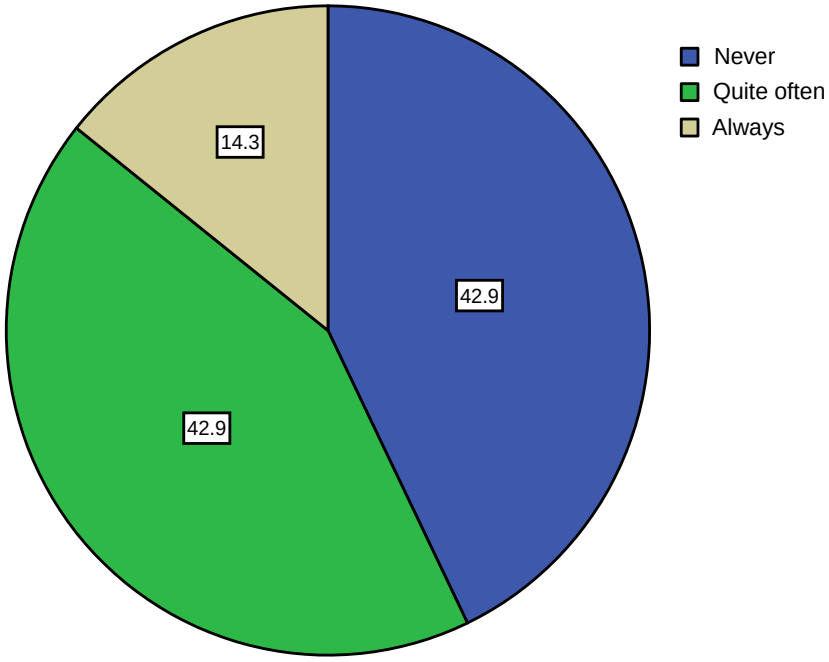

Figure 4.2 Distribution of head teachers' responses on how often internet is available for teachers use.

The findings in Figure 4.2 indicated that 43% of the head teachers said that internet was never available, 43% claimed that internet was quite often available while only 14% of the head teachers' indicated that the internet was always available for teachers' use in theirs schools. This means that there is still insufficient use of the internet in most schools in the study area, an indication that there is limited chance for teachers' to carryout research on the internet.

Teachers on the other hand were asked to show the extent to which they use the internet in the teaching - learning process. Figure 4.3 presents teachers' responses on the use of the internet.

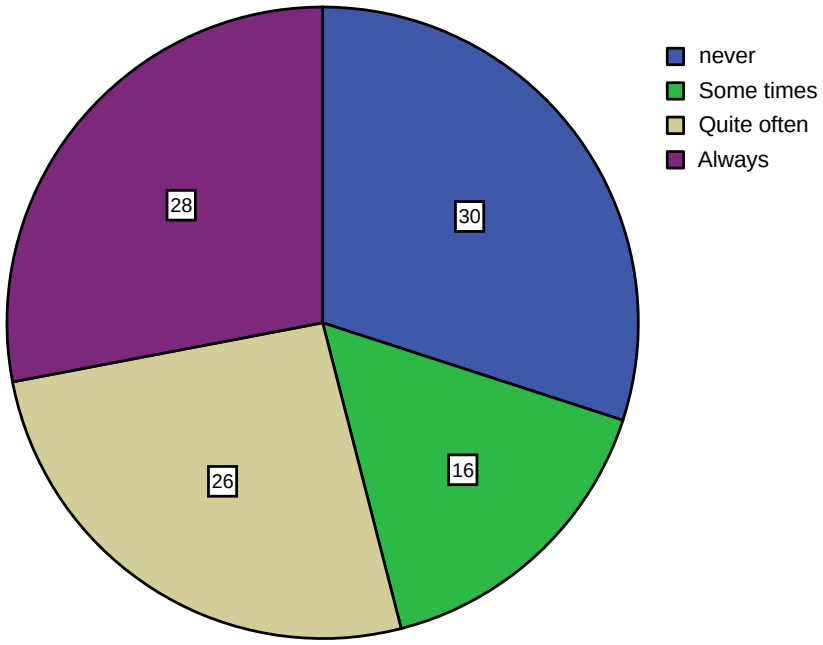

Figure: 4.3 Distribution of teachers' responses by their use of internet

The results in Figure 4.3 indicated that out of a total of 100 teachers, 30 (30%) of them had never used the internet, 16% sometimes used the internet, 26% use the internet quite often while 28% always used the internet. This indicated that most of the schools in the study area were not yet connected to the internet or the teachers were reluctant to use the internet for their class work even when it was available. This also means that there was limited research on the World–Wide-Web (WWW) which limits the teachers' use of up-to-date teaching and learning materials/information.

The study also explored the use of other ICT facilities apart from computers. This was because the researcher was aware that ICT means more than the use of computers. Therefore, Table 4.8 and Figure 4.4 present head teachers' and teachers' responses on the use of other ICT facilities.

Table: 4.8 Distribution of head teachers' responses on the use of other ICT facilities in teaching

	Category of responses			
	Never	**Sometimes**	**Quite often**	**Always**
Head teachers	3(42.9)	2 (28.6)	1 (14.3)	1 (14.3)

Figures in brackets represent percentage

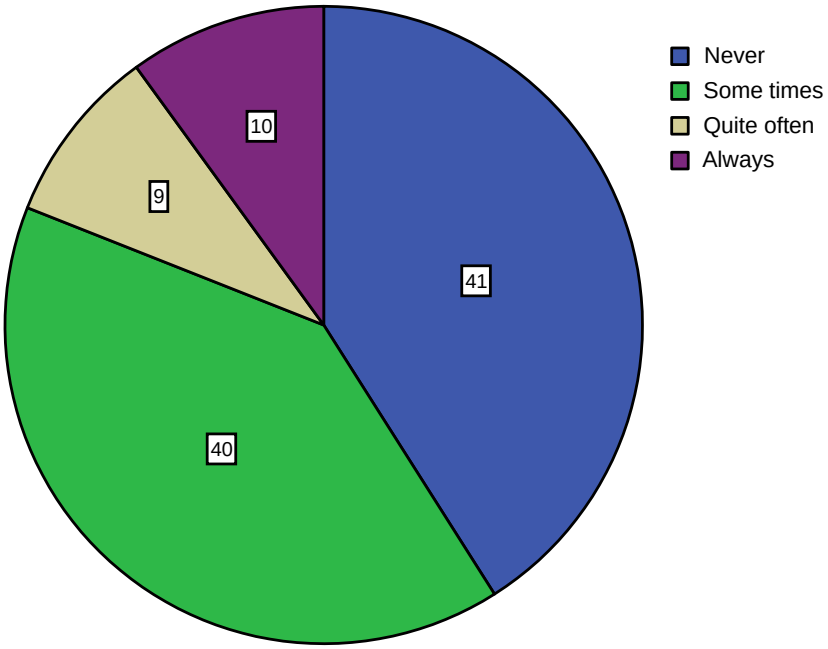

Figure: 4.4 Distribution of teachers' responses on the use of other ICT facilities along side computers.

Table 4.8, indicates that a bigger number (41%) of school administrators did not consider the use of other ICT apart from computers as very important for improving teaching probably because they had little skills in using such facilities in teaching. The majority (43%) of the school administrators indicated that other ICTs were not used in teaching, 29% of them indicated that other ICT facilities were at times used in teaching, while 14% of them indicated that other ICT facilities were used quite often while only 14% of all the school administrators indicated that these ICT facilities were always used. This implies that most

schools did not have other ICT facilities or did not know that such facilities like TVs, Radios and projectors could be used in teaching. In fact, some had a perception that ICT meant only computers.

Similarly, 41% of the teachers said that they had never used other ICT facilities in teaching and did not even know these facilities **(See figure 4.4);** 40% of the teachers said that they sometimes use other ICTs, nine percent were noted to be using other ICT quite often while only ten percent of teachers said that they always used other ICT facilities in teaching. This showed inadequate use of ICTs hence probably ineffectiveness in teaching. It also pointed to the fact that most teachers in the study area were still using traditional teaching methods.

There was also need for the study to find out whether teachers in the study area got technical assistance in cases where the ICTs used encountered a problem for instance trouble shooting in computers. Figure 4.5 gives data on how often teachers get technical assistance.

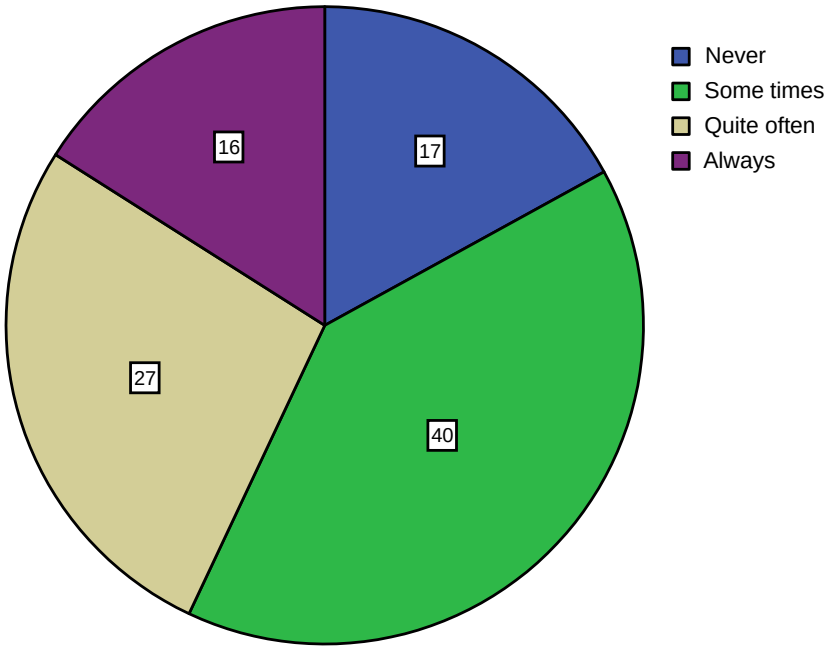

Figure: 4.5 Distribution of teachers' responses on how often they get technical assistance.

The findings in Figure 4.5 indicated that teachers were always offered inadequate technical assistance whenever it was needed. It was found out that 17% of the teachers did not get technical assistance, 40% of teachers sometimes got support, 16% got technical support quite often and only 16% of the teachers were always assured of technical assistance whenever it was required. This partly explains why a bigger portion of the teachers did not find it valuable to use ICT in their lesson delivery. It also confirmed why many schools reported the existence of many faulty computers.

4.3 Effect of ICT user-ability on teacher efficiency.

With the help of interviews and the questionnaires, the study elicited information on teachers' ICT skills that enabled them use ICT in teaching. Thus teachers were asked whether they have ever attended any training on the use of ICT and whether they attended seminars and refresher courses to enhance their ICT skills. Table 4.9 revealed the extent to which teachers attended seminars for purposes of enhancing their ICT skills.

Table: 4.9 Distribution of teachers' responses on how often they attend seminar.

	Category of responses			
	Never	**Sometimes**	**Quite often**	**Always**
Teachers	38 (38.0)	40 (40.0)	9 (9.0)	12 (12.0)

Figures in brackets represent percentage

In Table 4.9, it was found out that a bigger percentage (40%) of the teachers indicated that they sometimes attended ICT refresher courses and seminars to enhance their ICT skills in

their professional life. This is not a surprise because 70% of the teachers who participated in this study had had prior training in ICT application by either SchoolNet or Worldlinks for development and so were knowledgeable and could use ICT. 9% of the teachers quite often attended seminars but only 12% of the teachers always attended seminars. This means that teachers had interest and were motivated to learn more about ICT and apply it in their teaching. However 38% of the teachers indicated that they have never attended any seminars or refresher courses. This implies that there is still inadequate ICT skill enhancement for teachers and therefore limited chances for the application of ICT in teaching.

Teachers' were also asked to indicate their frequency of use for the various types of ICT in the context of classroom practice in percentage terms; that is, the level of ICT incorporation in lesson delivery. Thus Figure 4.6 presents teachers' response on their ICT incorporation in teaching.

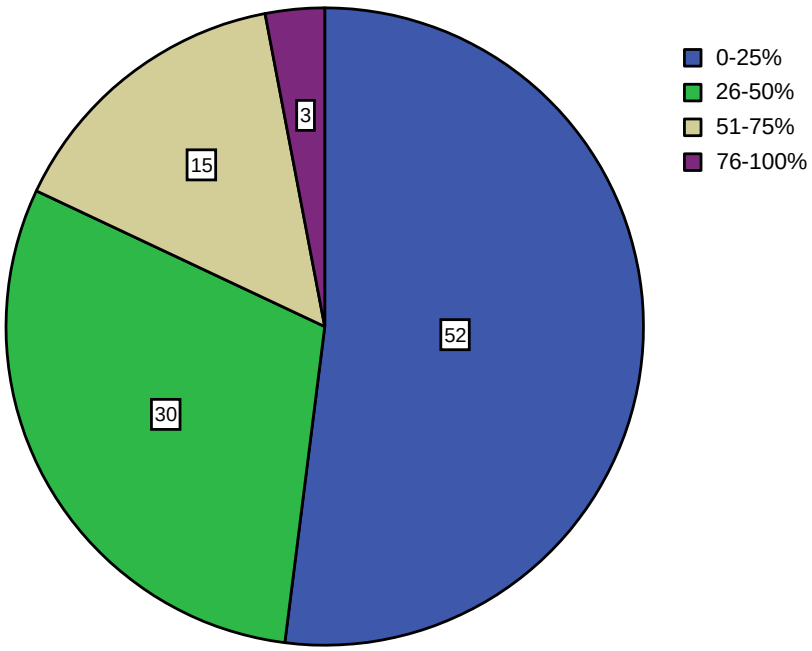

Figure: 4.6 Distribution of teachers' by their responses on the level of ICT incorporation in teaching.

The findings in figure 4.6 indicate that all teachers use ICT in teaching with the biggest percentage (52%) of all teachers showing that ICT occupy between 0 – 25% of their lessons, 30% indicated that ICT occupies 26 – 50% of their lesson but only 3% indicated that ICT occupied between 76 – 100% of their lessons. This is an indication that ICT usage still occupies a small percentage of teachers' lessons.

This study also evaluated how teachers use various forms of ICT during the teaching and learning process. The general picture which emerged from the teachers was a positive one. This is justified by some teachers' comments on the use of ICT. A teacher in Nabisunsa Girls School commented **"..... I use power point presentation when making student notes in mathematics because it takes shorter time to cover more topics"**

Another teacher from Lubiri Secondary School also said **"that unlike traditional class work which results in learners' playing a passive role, the innovative use of ICT is based upon group work, which had a positive influence on personal learning and development".** He further noted that students often learned how to pay attention to each other, how to adapt, how to help each other, share knowledge with each other and divide tasks among themselves if they are exposed to the use of ICTs.

4.4 Effect of access to ICT on teacher efficiency

The study further explored how teachers kept abreast with the increasing demand for keeping up –to-date with ICT in terms of skills, requirements and knowledge. It is important to keep up-to-date with new development in the field of ICT for one to use ICTs effectively

well. Figure 4.7 present data on how teachers' are often equipped with ICT skills and knowledge.

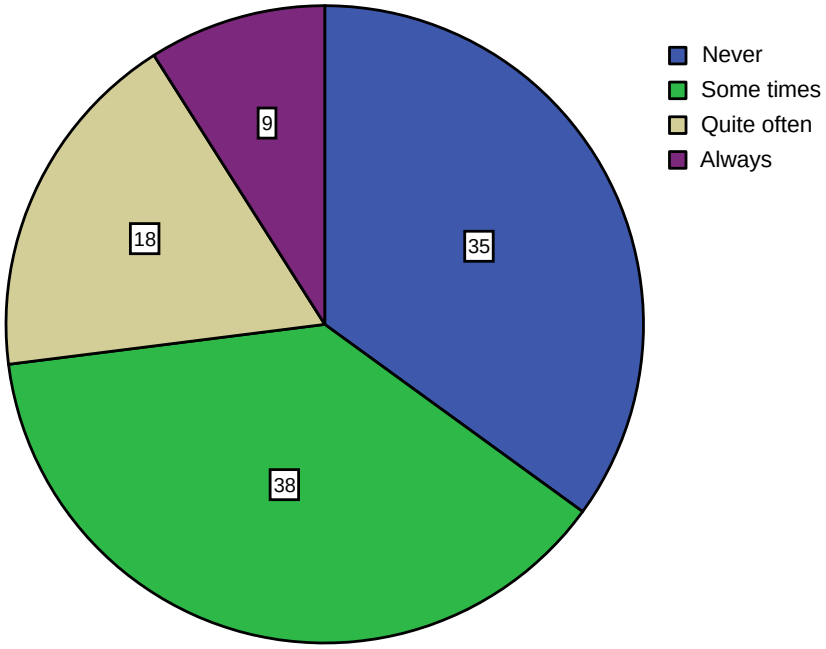

Figure: 4.7 Distribution of teachers by their responses on how often they are equipped with up-to-date ICT skills and knowledge

The findings in Figure 4.7 indicated that most teachers (38%) are sometimes equipped with better and up-to-date ICT skills, 35% of them are never equipped and only nine percent said that they are always equipped with up –to-date ICT skills. This is an indication that there are still inadequate ICT personnel in secondary schools in the study area. This limits effective use of ICTs, thus leading to teacher inefficiency.

The study also explored on teachers' access to ICTs in their respective schools. In this case, the researcher was interested in finding out how often teachers use school computers and

other ICTs. Table 4.10 and Figure 4.8 provide data on how teachers' are often allowed to use computers and other ICTs in secondary schools in the study area.

Table: 4.10 Distributions of school administrators' by their responses on how often teachers used school computers and other ICTs

	Category of responses			
	Never	**Some times**	**Quite often**	**Always**
Head teachers	2 (29)	1 (14)	1 (14)	3 (43)

Figures in brackets represent percentage

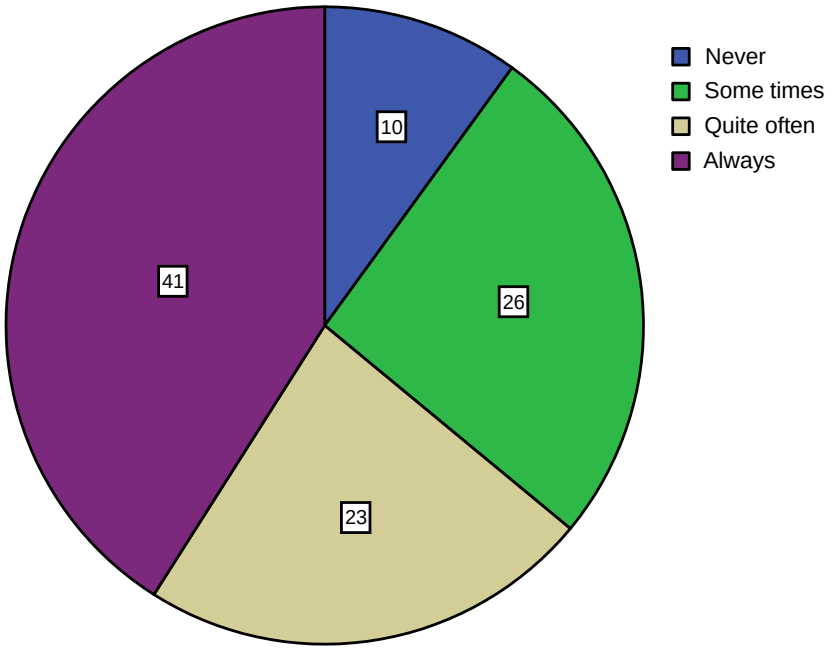

Figure: 4.8 Responses on how often teachers were allowed to use computers and other ICTs

In Table 4.10 and Figure 4.8, the results show that 90% of all teachers are allowed to use school computers and other ICTs in teaching with only ten percent never allowed. In other

words the majority (41%) of the teachers' are always allowed to use computers and other ICTs, while 23% of them are quite often allowed and 26% of the teachers are sometimes allowed to use ICTs in teaching.

The results from the interviews conducted further indicated that some school administrators had to be consulted before teachers use ICTs in teaching and teachers' professional development. In other words the teachers' had to seek permission before using ICTs in teaching. However, the majority of the school administrators indicated that they do not have to be consulted by teachers in order to use the schools' ICT facilities; an indication that ICTs are always available for teachers' use.

In order to find out how ICTs leads to teacher efficiency, the researcher sought to establish how teachers employ ICT in content delivery. Table 4.11 and Figure 4.9 present teachers' and school administrators' responses on the use of ICT and content delivery.

Table: 4.11 Distribution of School administrators by their responses on ICT and content delivery

	Category of responses			
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
Head Teachers	1 (14.3)	1 (14.3)	3 (42.9)	2 (28.6)

Figures in brackets represent percentage

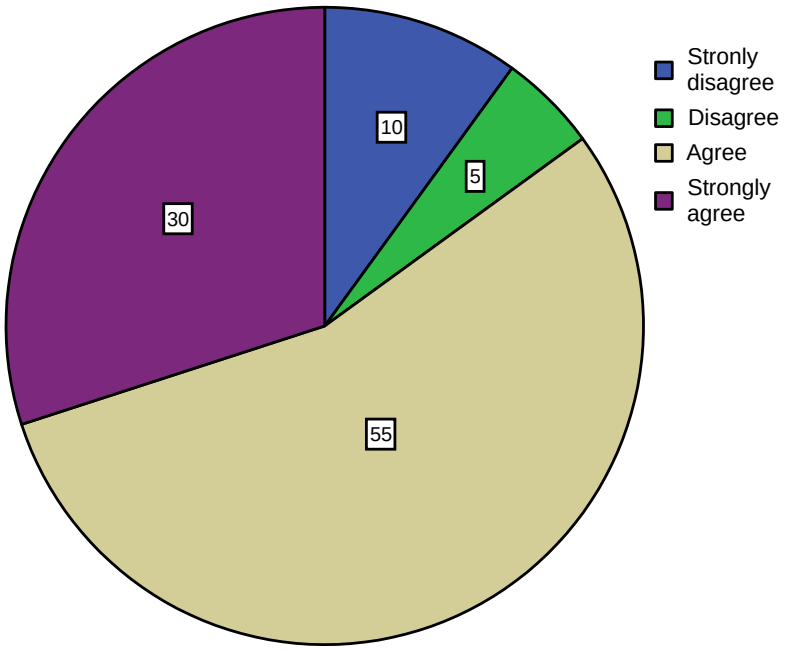

Figure: 4.9 Distribution of teacher respondents by their responses on how ICT improves content delivery

The results from figure 4.9 indicated that majority (55%) of the teachers agreed while 30% of them strongly agreed that the use of ICT improves content delivery in teaching. Only five percent of the respondents disagreed with the assertion that ICT improves teacher content delivery. Similarly, results from table 4.11 shows that 14% of school administrators disagreed, another 14% strongly disagreed while 43% agreed and 29% strongly agreed that the use of ICT actually improves teachers' content delivery. In other words, the majority (72%) of the school administrators believe that the use of ICT improves teachers' content delivery. It is also evident that the majority of the teachers (85%) considered the use of ICT as very important in improving their content delivery.

It was also important for this study to establish the extent to which ICTs helped teachers cover the syllabus. Teachers' were thus asked whether the use of ICTs enabled them cover

the syllabus in time and with ease. Figure 4.10 provide teachers' responses on the use of ICTs and syllabus coverage.

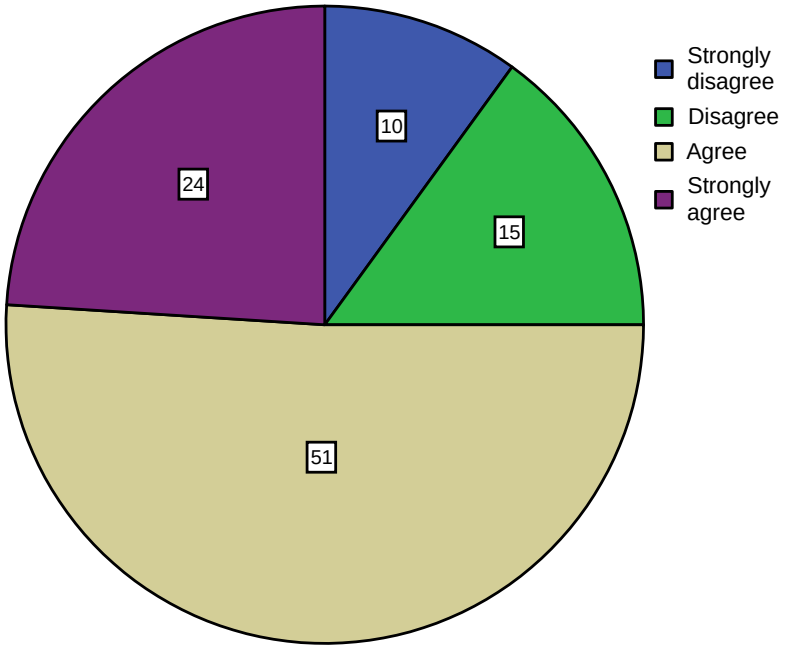

Figure: 4.10 Distribution of teacher respondents by their responses on how ICT enables them cover the syllabus in time.

Findings in figure indicated that 51% of the teachers agreed that the use of ICT helped them cover the syllabi in time; 24% of them strongly agreed while 15% disagreed and only ten percent strongly disagreed with the assertion that the use of ICT fastened teachers' syllabi coverage. This implies that some teachers still preferred traditional methods of teaching and have nothing to do with the new era of technology.

The results from the interviews with the school administrators revealed that they regard the use ICT as important in helping teachers cover the syllabi in time and with ease; hence efficiency. However, some school administrators seemed not convinced that ICTs can play

an important role in easing teachers' work thus strongly disagreeing with their colleagues who said that the use of ICTs enables teachers' cover the syllabi in time and with ease.

Table 4.12 and Figure 4.11 report on the use of ICT in student assessment with the purpose of establishing the effectiveness of ICT in assessing student performance in the study area.

Table: 4.12 Distribution of School administrators by their responses on ICT and Student assessment

	Category of responses			
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
Head Teachers	3 (42.9)	---	2 (28.6)	2 (28.6)

Figures in brackets represent percentage

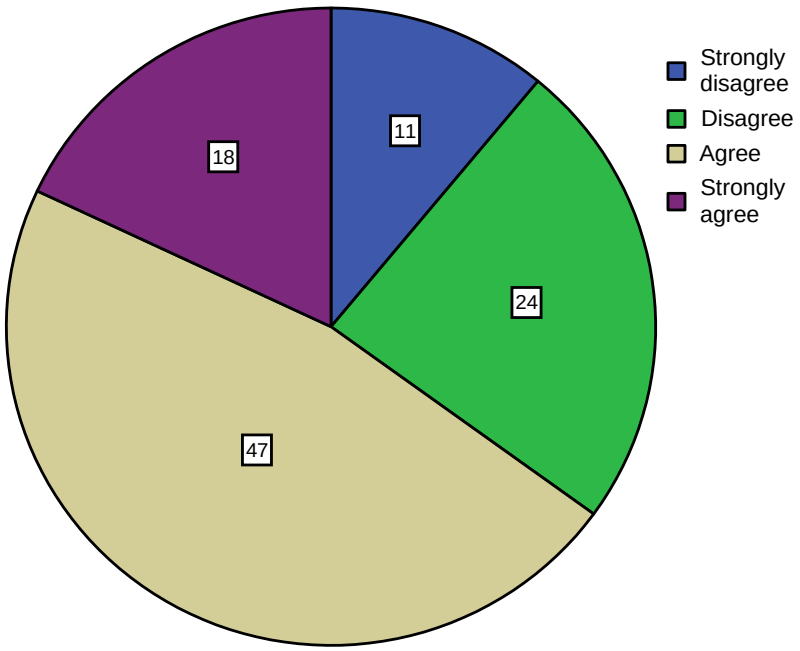

Figure: 4.11 Distribution of teachers' by their responses on how ICT fastens student assessment.

According to Figure 4.11, it is clear that most teachers regarded the use of ICT as the best tool as far as student assessment was concerned. As a result, 65% of the teachers used in this study indicated that the use of ICTs made it easier and faster to assess learners. Similarly, results from Table 4.12 indicated that 29% of the school administrators agreed that the use of ICTs helped to fasten student assessment while (29%) of the respondents strongly agreed to this fact. However, the majority 43% strongly disagreed that the use of ICT fastened student assessment. This implies that they are still comfortable with traditional assessment methods.

In order to gain an understanding on how teachers carry out their research in order to use up–to–date information, teachers were asked whether the use of ICTs enhanced their research. Figure 4.12 provide data on the use ICT and teachers' research work.

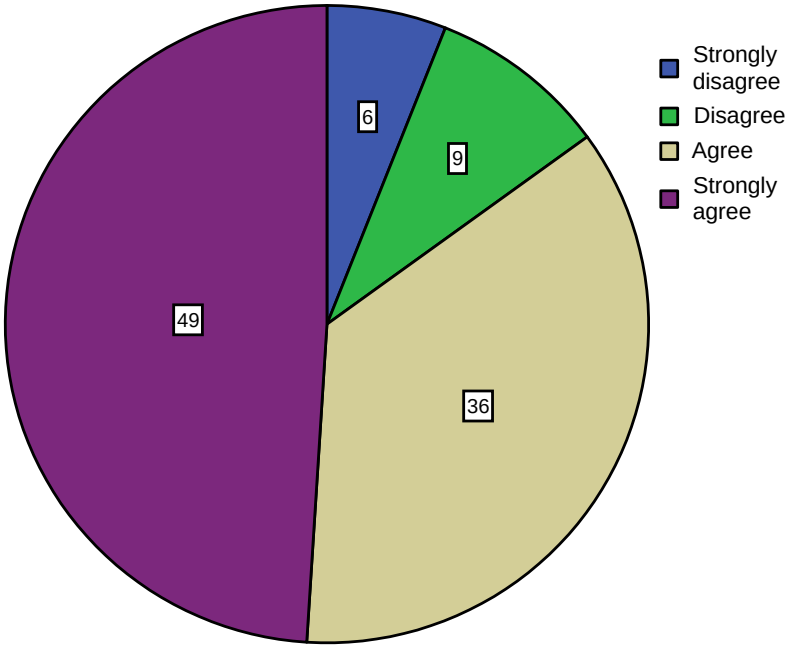

Figure: 4.12 Distributions of teachers' by their responses on how ICT enhances research.

The findings indicate that 36% of the teachers argued that the use of ICTs enhances research; but 49% strongly agreed, nine percent disagreed and only six percent strongly disagreed with the fact that ICT use enhances their research work. It is therefore evident that the majority of the teachers (85%) consider ICT as paramount for effective research to be done with the help of the World Wide Web.

The findings from the interviews indicated that school administrators considered ICTs to be of great importance if effective research was to be done. One school administrators said that **"**the use of ICT enhanced research**"**. This implies that effective research can be done with the help of new technologies; thus, ICT use fastens teachers' research leading to teacher efficiency.

4.4 Testing of research hypotheses

4.4.1 Hypotheses One

The first research hypothesis (H_o) was; "There is no significant relationship between availability of ICT and teacher efficiency". The validity of this hypothesis was tested by correlating availability of ICT with the different items that constituted teacher efficiency using Pearson product moment correlation (PCC). Regarding availability of ICT, respondents were asked to rank the adequacy (quantity) and quality of ICT for teachers' use. The ranking was on a four point likert scale ranging from never to always. Regarding teacher efficiency respondents were asked to show how ICT enable them to prepare lessons, carry out research, and cover syllabus in time. Responses to these items were also on a four likert scale ranging from strongly disagree to strongly agree. The two numerical indices

were correlated to determine whether there was a significant relationship between the two variables using Pearson Correlation Coefficient. The findings are summarized in table 4.20.

Table: 4.13 the computed PCC between ICT availability and teacher efficiency.

		Availability	Efficiency
Availability	Pearson correlation	1	.268
	Sig. (2-tailed)	.	.016
	N	80	80
Efficiency	Pearson correlation	.268	1
	Sig. (2-tailed)	.016	.
	N	80	80

From Table 4.13 it was found out that the computed PCC was 0.268 and the significant level or probability value (P- value) was 0.016 (**See Table 4.13**). This P- value was less than the benchmark for social sciences of 0.05 therefore, the null hypothesis was rejected and the research hypothesis upheld. Thus it was concluded that there was a positive and significant relationship between availability of ICT and teacher efficiency. Thus, the more available ICT was, the more efficient teachers became. This implies that availability of ICT influences teacher efficiency.

4.4.2 Hypotheses Two

The second research hypothesis (H_o) was; "There is no positive relationship between user-ability of ICT and teacher efficiency. The validity of this hypothesis was tested by correlating ICT user-ability with the different items that constituted teacher efficiency using Pearson product moment correlation (PCC). Regarding user-ability of ICT, respondents were asked to rank the level of application of ICT in their lessons and ICT skills attained.

The ranking was on a four point likert scale ranging from never to always. Regarding teacher efficiency respondents were asked to show how they used ICT in lesson preparation, carrying out research and student assessment. Responses to these items were also on a four likert scale ranging from strongly disagree to strongly agree. The two numerical indices were correlated to determine whether there was a significant relationship between the two variables using Pearson Correlation Coefficient. The findings are summarized in Table 4.14

Table: 4.14 The computed PCC between ICT user-ability and teacher efficiency

		User-ability	Efficiency
User-ability	Pearson correlation	.458	.258
	Sig. (2-tailed)	.000	.010
	N	80	100
Efficiency	Pearson correlation	.258	.458
	Sig. (2-tailed)	.010	.000
	N	100	80

It was found out that the computed PCC was 0.258 and the significant level or probability value (P- value) was 0.010 (**See Table 4.14**). This P- value was less than the benchmark for social sciences of 0.05 therefore, the null hypothesis was rejected and the research hypothesis upheld. Thus it was concluded that there was a positive and significant relationship between ICT User-ability and teacher efficiency. Thus, the more teachers use ICT the more efficient they become. This implies that ICT user-ability influences teacher efficiency.

4.4.3 Test of hypothesis three

The third research hypothesis (H_o) was; There is no significant relationship between ICT accessibility and teacher efficiency. The validity of this hypothesis was tested by correlating accessibility of ICT with the different items that constitute teacher efficiency using Pearson product moment correlation (PCC). Regarding accessibility of ICT, respondents were asked to show the procedure of access to ICT and how often teachers accessed ICT in their respective schools. The ranking was on a four point likert scale ranging from never to always. Regarding teacher efficiency respondents were asked to show how often they accessed ICT to prepare lessons, carry out research, and cover syllabus in time. Responses to these items were also on a four likert scale ranging from strongly disagree to strongly agree. The two numerical indices were correlated to determine whether there was a significant relationship between the two variables using Pearson Correlation Coefficient. The findings are summarized in table 4.15.

Table: 4.15 The computed PCC between ICT accessibility and teacher efficiency

		Accessibility	Efficiency
Accessibility	Pearson correlation	.438	.407
	Sig. (2-tailed)	.000	.000
	N	80	100
Efficiency	Pearson correlation	.407	.438
	Sig. (2-tailed)	.000	.000
	N	100	80

It was found out that the computed PCC was 0.407 and the significant level or probability value (P- value) was 0.000 (**See Table 4.15**). This P- value was less than the benchmark for social sciences of 0.05 therefore, the null hypothesis was rejected and the research hypothesis upheld. Thus it was concluded that there was a positive and significant

relationship between accessibility of ICT and teacher efficiency. Thus, the more accessible ICT is the more efficient teachers will be. This implies that accessibility of ICT influences teacher efficiency.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter brings together information from the three main parts of the study; namely: ICT availability and teacher efficiency, ICT accessibility and teacher efficiency as well as ICT user–ability and teacher efficiency. The chapter is divided into four sections: the introduction, discussions, conclusions and recommendations.

5.1 Discussion

5.1.1 ICT availability and teacher efficiency

The study established that various ICT tools are used by teachers for teaching purposes. The most common ICT tool used in the schools in the study area is the computer. However, there are other ICT tools present in some schools as per the definition used in this study. A number of technological challenges were revealed including, few computers, inadequate computer maintenance and lack of reliable internet connectivity. In general, schools did not have adequate ICT infrastructure and equipment. This situation hinders effective use of ICT in teaching.

The study further established that the success of ICT application into curriculum delivery greatly depended on the capacity to acquire and maintain ICT facilities, teachers' awareness and attitude towards the use of ICT and the quantity of ICT available at school. All schools had computers with CD-Rom drives making it possible to use CDs in teaching and establishment of CD libraries. Some schools (50%) had internet connection; an indication that teachers can access and use a wide range of information available on the internet.

The study found out that there are more computers compared to other ICT tools at schools. This inadequate quantity of ICTs is similar to what Babirye and Kalema (2001) found out seven years ago; an indication that there has been little effort to equip schools with ICT facilities over the past five years. It is also similar to what Cholins (2005) and Kisaakye (2006) found out that there is still inadequate ICT integration in classroom thus limiting effective access to ICT resources.

The study indicated that most head teachers (57%) were positive towards the use of ICT in teaching and many of them had allocated a vote on the school budget for the purchase of new and the maintenance of computers. It was also found out that ICT policies are not well documented. In other words; policies on ICT utilization in schools are just communicated verbally. Therefore, there is need to formulate and develop policies regarding the ICT use in schools. However, the study also revealed that apart from computers, other ICT tools for teaching such as Video conferencing, interactive white boards, projectors, scanners, television, and microphone were lacking. In areas where they were present, they were often not used due to lack of skills on how to use them.

The findings further revealed that there is high student computer ratio. It also revealed that there are computers whose functional status is poor. This can be taken as a great hindrance to the application of computer–based resources in teaching in secondary schools. This implies that a computer is still an element rather than an integral part in the delivery of the secondary school curriculum. This is similar to what Kisaakye (2006) found out three year ago an indication that there has been little effort by school administrators to equip schools with enough ICT facilities.

5.1.2 ICT user-ability and teacher efficiency

The study revealed that the use of ICT improves the efficiency and effectiveness of school administration. Administratively, ICT has been used for coordinating and communicating school programs through e-mail correspondence, monitoring and evaluation of schools. On the other hand the study revealed that teachers are using ICT programs to prepare assessment tests and schemes of work and lesson plan. Schools have also used ICT to computerize student progressive reports and grading of final results as well as teach computer lessons. Becta, (2004) report that with ICT, teachers are able to create their own materials and have more control over the materials used in the classroom.

The study further revealed that much as World links and Schoolnet had facilitated the use of ICT through equipping teachers with tools and skills in the application of ICT in teaching, its use was restricted to personal use where by teachers could only utilize word processing and internet use especially reading their mails. This was attributed to the fact that their computer skills were not yet very strong. This also affected their confidence and motivation to use ICT to enhance teaching. Besides, few of them could use it on a daily basis due to

limited ICT infrastructure. Similar findings were reported by Odongo (2006). However, there was evidence that in some areas teachers used ICT to enhance teaching. Theses areas proved that the use of ICT can be a good mechanism not only to motivate learners during the teaching and learning process but also for efficient content delivery. This is also similar to Kizito (1995) found out fourteen years ago.

The study revealed that some teachers had competency in using ICT in the teaching for instance illustrations into ICT-based formats that can be delivered using computer related tools. Others were noted to be using internet and other ICT-based educational resources to enrich their teaching materials.

ICT is used in schools as a source of information from which teachers obtain teaching materials. It has been used as a teaching aid to illustrate abstract concepts like continental drift theory in geography subject. Teachers and students have developed computer skills and knowledge in website designing. Whitworth & Berson (2003) stated that students today no longer resigned to simply typing their work into processor but are building web pages, designing power point presentations, processing photos and creating art work. Students are also using digital cameras and videos to record the school events. This study has shown that students' level of participation in most of activities using ICT based resources is still low in most of the schools in Uganda.

5.1.3 ICT accessibility and teacher efficiency

The study concluded that teachers are using ICT for classroom practice, personal use and administration. Though the internet and World Wide Web are available in schools, the level

of their use in teaching is still low. This was due to lack of enough knowledge and inaccessibility to computers. But in other cases it was attributed to the fact that the internet and World Wide Web had just been introduced in schools. Their use though low is encouraging and the opportunity for high use is likely. This is based on the fact that ICT was introduced recently in Ugandan school (Hawkins, 2001) and few teachers begun training in introduction to internet for teaching and learning and training in technical competence in handling computer hard ware and soft ware in 1998 (Bloom, 2001).

The study revealed that both teachers and head teachers had a strong attitude towards the use of information and communication technology in the teaching-learning process. The study also revealed that many teachers 70% were willing to adapt to change and continue using ICT especially computers in teaching. However the study revealed that ICT integration into secondary school curriculum is to a small extent. Similar findings were reported by Babirye and Kalema (2001) and Kisaakye (2006). This means that the ministry of education and curriculum implementers has been reluctant in enforcing the application and integration of ICT in the secondary school curriculum.

The findings also revealed the challenges faced in the use of ICT in teaching and learning. They include high maintenance cost, high student computer ratio, obsolete and poor computer functionality status, expensive ICT equipment and lack of training. Similar findings were reported by Babirye and Kalema (2001) and Kisaakye (2006), an indication that these problems have persisted. The study also revealed that there was rigid protocol that teachers have to go through to access ICT and poor internet connectivity. Similar findings were reported by Babirye and Kalema (2001).

5.2 Conclusions

5.2.1 Availability of ICT in schools

The study concluded that there were various ICT tools in secondary schools in the study area used by teachers in teaching (Table 4.6 & 4.7). The most common ICT tools were computers. All schools had computers with CD-Rom drives making it possible to use CDs in teaching and establishment of CD libraries. Most schools (50 %) had internet connection an indication that teachers accessed and use a wide range of information available on internet. Thus availability of ICTs influences teacher efficiency.

5.2.2 User-ability of ICT in teaching

The study concluded that effective use of ICT coupled with continuous refresher courses for teachers would improve content delivery, fasten syllabi coverage as well as easing student assessment. Therefore user-ability of ICT significantly affects teacher efficiency.

5.2.3 Accessibility of ICT in schools

The study also concluded that access to ICT resources have enabled teachers to use them in improving their efficiency in terms of computation of students' marks, grades and computerization of student progressive reports. The study revealed that (70%) of teachers accessed ICT based resources in their respective schools. Considering the notion access to ICT is a factor which significantly affect teachers use of ICT and hence efficiency. It can therefore be concluded that accessibility of ICT has a positive effect on teacher efficiency.

5.3 Recommendations

1. There is need for teachers in the training institutions to be imbued with the skills and abilities of ICT literacy and sensibilities so that the knowledge and attitude acquired will cascade onto the learners they come in contact with in the classrooms when they begin to practice. Therefore, the use of ICT for professional development of teachers who have already completed their training but need to be introduced to new methodologies and innovations in their subject areas must be seriously explored. Since it may be impractical to send back all teachers that are currently teaching to the institutes for re-tooling and re-skilling them in the new emerging fields of knowledge, distance learning through the use of modern ICT tools may well be the only means of re-training the corps of teachers in the field who are in need of serious re-training.

   Consequently, the government, non-governmental and international agencies should set policy agenda for introducing an ICT driven teacher education curricular for developing countries such as Uganda. This is because the advantage of the convergence of information and communication technologies are being brought into many aspects of human life by the industries, therefore it behoves of the teaching force to also buy into this development, since teachers are the custodians of knowledge in this knowledge driven era.

2. There is need to boost teachers confidence in the use of ICT for teaching. If teachers are to make informed decisions about the relevance of ICT resources to meet their needs and the needs of the learners, it is important that they become aware of the wide range of ICT resources and their potential in the teaching process. Projects like Worldlinks and schoolnet should impart more technical skills and knowledge through

training of teachers. This would enable teachers to effectively integrate ICT into their core teaching practice as well as creating confidence among teachers in the use of ICT.

3. There is need for school administrators and management to increase access of ICT facilities and tools to teacher e.g. schools should have computer centres for teachers geared towards capacity building in teachers. This will help over come the rigid protocol teachers have to go through to access ICT. This will also create motivation and greater ICT use in teaching leading to efficiency. These computer centres would also reduce on user competition between teachers and students. This would enable teachers have space and time for professional development in the use of ICT which is often lacking.

   Besides, improving the functionality status of computers is also imperative. The school administrators should ensure that they cope with the demands of computer breakdowns. This could be done by liaising with projects like Worldlinks, schoolnet among others that have tried to help schools cope with computer breakdown. Computer technicians could be employed at the schools since they are important for daily computer maintenance and problem rectification.

5.3.1 Recommendations for further study

1. The geographical scope of this study was limited to Kampala district due to the time and financial constraints. Therefore applicability/relevancy of this study to the whole country is not feasible. Therefore it is recommended that further research be carried out on a wider coverage scope.

2. There are some ICT initiatives targeting primary schools in respect of integrating ICT in teaching and learning. Therefore further research should be carried out to evaluate the performance/ efficiency of primary teachers who have integrated ICT in teaching – learning process.

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APPENDIX A

QUESTIONNAIRE ON ICT AND TEACHER EFFICIENCY FOR SECONDARY SCHOOL TEACHERS IN KAMPALA DISTRICT

This questionnaire is designed to establish the influence of ICT on teacher efficiency in the teaching–learning process in secondary schools in Kampala. Individual responses will be kept strictly confidential to the researcher although the results of statistical and other analyses of data may be published in non-attributable and aggregated form. You are therefore kindly requested to fill in all the responses honestly.

Please tick **(√)** where necessary or fill the space provided.

1. Name of your school…….....
2. Your Age (in years) (a) 20 and below ☐ (b) 21 –30 ☐ c) 31-40 ☐ d) 41- 50+ ☐
3. Your Gender (a) Male ☐ (b) Female ☐
4. Your Highest academic qualification

(a) Diploma ☐ (b) Bachelors Degree ☐ (c) Masters Degree ☐ (d) Others ☐

5. How long have you been teaching (in years)?

(a) 10 and Below ☐ (b) 11 - 20 ☐ (c) 21 - 30 ☐ (d) 31 – 40+ ☐

6. Which subjects do you teach?

i. ……

ii. ……

iii. ……

7. What level do you teach? (a) O'level ☐ (b) A' level ☐ (c) Both ☐
8. How many computers do you have in the school? .....

9. How many of these are available for your classroom work?.....

10. How many students do you averagely teach in a class each time? .....

11. Identify the following ICT facilities other than computers you use for your teaching ;

i. Internet ☐

ii. Video conferencing ☐

iii. Printers ☐

iv. CD/DVD ROM (s) ☐

v. Interactive white boards ☐

vi. Projectors ☐

vii. Television ☐

viii. Microphone ☐

ix. Video cameras ☐

Using your expertise on current state of ICT in your school, indicate your opinion on the following. **<u>Please tick (√) the appropriate level that portrays your opinion</u>**

Key: **1 = Never**

2 = Sometimes

3 = Quite often

4 = Always

No.		**1**	**2**	**3**	**4**
12	How often is the internet available for your use on school computers?				
13	How often is relevant information available on the internet for use in teaching?				
14	How often are other ICT facilities available for use in teaching along side computers?				
15	How often do you get technical assistance whenever you need it?				

a. Mention some of the factors affecting the availability of ICT facilities in this school

i. ……

ii. ……

iii. ……

17 Have you ever attended any training on the use of ICT **YES** ☐ **NO** ☐

18 Please mention what you are now able to use the ICT for which you could not before the training Course…….....

19 When was the last time you received ICT training for teaching and learning purposes?……

20 How would you describe your comfort levels in using ICT in your teaching?.....……

21 What are the reasons for choosing to use ICT in your teaching? .....……

……

……

22 In your opinion what percentages of your lessons incorporate ICT?

(a) 0 – 25 % ☐ (b) 26 – 50% ☐ (c) 51 – 75 % ☐ (d) 76 – 100 % ☐

Using your expertise on current state of ICT in your school, indicate your opinion on the following. **<u>Please tick (√) the appropriate level that portrays your opinion</u>**

Key: **1 = Never**

2 = Sometimes

3 = Quite often

4 = Always

No.		1	2	3	4
24	How often do you attend seminars to enhance your ICT skills?				
25	How often do you use ICTs in teaching?				
26	How often are you equipped with update ICT facilities?				

27 Mention three major factors limiting your ability to use ICT facilities in this school

i. ……..

ii. ……..

iii. ……..

Using your expertise on current state of ICT in your school, indicate your opinion on the following. <u>Please tick (√) the appropriate level that portrays your opinion</u>

Key: 1 = Never

2 = Sometimes

3 = Quite often

4 = Always

No.		1	2	3	4
28	How often are you allowed to use school computers and other ICTs?				
29	How often do you need to seek permission from authorities to use ICTs?				
30	How often do you access the internet for information while at school?				
31	How often do you access the internet for information outside your school?				
32	How often do you download information that helps you teach better?				
33	How often do you acquire ICT facilities through the School budget?				

34	How often do you acquire ICT facilities through donation?				

35 Identify four main factors limiting your access to ICT facilities in this school

a. ……..

b. ……..

c. …….

d. …….

Using your expertise indicate the extent to which you agree or disagree with the following statements. Please tick the appropriate box to indicate your opinion

Key: SD = Strongly Disagree

D = Disagree

A = Agree

SA = Strongly Agree

No.		**SD**	**D**	**A**	**SA**
36	The use of ICT helps me prepare for lessons in a shorter time.				
37	The use of ICT improves content delivery in my teaching				
38	The use of ICT allows interactivity in the teaching process				
39	The use of ICT helps me cover the syllabus in time and with ease				
40	The use of ICT makes it easier and faster to assess my learners				
41	The use of ICT enables me give projects the learners regularly				
42	The use of ICT enhances my research				

43 Please outline some examples of how you use ICT in your teaching…….....

……

……

……
…….....

THANK YOU FOR YOUR COOPERATION

APPENDIX B

QUESTIONNAIRE ON ICT AND TEACHER EFFICIENCY FOR SECONDARY SCHOOL HEADTEACHERS IN KAMPALA DISTRICT

The objective of this questionnaire is to establish the influence of ICT on teacher efficiency in the teaching–learning process in secondary schools in Kampala. Individual responses will be kept strictly confidential to the researcher although the results of statistical and other analyses of data may be published in non-attributable and aggregated form. You are therefore kindly requested to fill in all the responses honestly.

Please tick **(√)** where necessary or fill the space provided.

1. Name of your school……....
2. Your Age (in years) (a) 20 and below ☐ (b) 21 – 30 ☐ (c) 31 – 40 ☐ (d) 50+ ☐
3. Your Gender (a) Male ☐ (b) Female ☐
4. Your Highest academic qualification
   (a) Diploma ☐ (b) Bachelors Degree ☐ (c) Masters Degree ☐ (d) PhD ☐
5. How long have you been teaching (in years)
   (a) 10 and below ☐ (b) 11 - 20 ☐ (c) 21 – 30 ☐ (d) 31 – 40+ ☐
6. How many computers are there in your school?.....
7. How many of these are available for teachers use in their classroom work?.....
8. How many students on average are in each stream?.....
9. Identify from the following ICT facilities other than computers used for teaching in your school
   i. Internet ☐

ii. Video conferencing ☐

iii. Printers ☐

iv. CD/DVD ROM (s) ☐

v. Interactive white boards ☐

vi. Projectors ☐

vii. Television ☐

viii. Microphone ☐

ix. Video camera ☐

Using your expertise on current state of ICT in your school indicate your opinion on the following. **<u>Please tick (√) the appropriate level that portrays your opinion</u>**

Key: **1 = Never**

2 = Sometimes

3 = Quite often

4 = Always

No.		**1**	**2**	**3**	**4**
10	How often are computers in your school available for teachers use?				
11	How often is the internet available in your school for teachers to use?				
12	How often are other ICT facilities available in your school for teachers use along side computers?				
13	How often do your teachers find and share information with other computer users on-line?				
14	How often can teachers get technical assistance whenever they need it?				

15. Mention some of the factors affecting the availability of ICT facilities in this school

i. ……..

ii. ……...

iii. ……

iv. …….

16. Have your teachers ever attended any training on the use of ICT? **YES** ☐ **NO** ☐

17. When was the last time teachers in your school received ICT training for teaching and learning purposes?……

18. How would you describe the comfort levels of your teachers in using ICT in teaching?.....
.....

19. What do you think are the reasons why teachers in your school use ICT in their teaching?
……
……
……

20. In your opinion what percentage of your teachers lessons incorporate ICT?

(a) 0 – 25 % ☐ (b) 26 – 50% ☐ (c) 51 – 75 % ☐ (d) 76 – 100 % ☐

Using your expertise on current state of ICT in your school indicate your opinion on the following. **<u>Please tick (√) the appropriate level that portrays your opinion</u>**

Key: **1 = Never**

2 = Sometimes

3 = Quite often

4 = Always

No.		1	2	3	4
21	How often do teachers in your school attend seminars and refresher courses to enhance their ICT skills?				
22	How often do teachers in your school use ICTs in their teaching?				
23	How often is your school equipped with update ICT facilities for teachers use?				

24. Mention three major factors limiting your teachers' ability to use ICT facilities in this school

i. ……..

ii. ……..

iii. …….

Using your expertise on current state of ICT in your school indicate your opinion on the following. **<u>Please tick (√) the appropriate level that portrays your opinion</u>**

Key: **1 = Never**
2 = Sometimes
3 = Quite often
4 = Always

No.		1	2	3	4
25	How often are teachers in your school allowed to use school computers and other ICTs?				
26	How often do teachers in your school need to seek permission from authorities to use ICTs?				
27	How often can teachers in your school access the internet for information while at school?				
28	How often can teachers in your school download information from the internet that helps them teach better?				
29	How often do you acquire ICT facilities through the School budget?				
30	How often do you acquire ICT facilities through donation?				

31 Does your school have some ICT needs that are currently not being met?**(a)YES** ☐ **(b) NO** ☐

If yes, what are these and how could they be met?.....

32. Identify four main factors limiting teachers' access to ICT facilities in this school

a. ……

b. ……

c. ……

d. ……

Using your expertise indicate the extent to which you agree or disagree with the following statements. Please tick the appropriate box to indicate your opinion

Key: **SD = Strongly Disagree**

D = Disagree

A = Agree

SA = Strongly Agree

No.		**SD**	**D**	**A**	**SA**
33	The use of ICT helps your teachers to prepare lessons in shorter time				
34	The use of ICT improves teachers content delivery in the teaching process				
35	The use of ICT allows interactivity in the teaching process				
36	The use of ICT helps teachers cover the syllabus in time and with ease				
37	The use of ICT makes it easier and faster for teachers to assess their learners				
38	The use of ICT enables teachers give projects to the learners regularly				
39	The use of ICT enhances teachers research				
40	The use of ICT makes it easy for teachers to compute student results				

41 Please outline some examples of how teachers in your school use ICT in teaching……..……
……
……

THANK YOU FOR YOUR COOPERATION

APPENDIX C

INTERVIEW GUIDE FOR SECONDARY SCHOOL HEAD TEACHERS

The objectives of this interview guide is to get the general opinions of the school heads on general themes like the state and application of ICTs in teaching, budget allocation, achievements so far resulting from the use of ICTs, problems being encountered, policy issues and future prospects.

Definition of ICT:

For purposes of this study ICT (Information and communication Technology) means: The forms of technology that are used to transmit, store, create, share or exchange information electronically in a digital form.

Name…… school……

Gender Male ☐ Female ☐

1. How long have you been in this school?
2. Does this school encourage teachers to use ICT in teaching?
3. What is the current state and application of ICTs in teaching and learning?
4. Are teachers comfortable with the use of ICT in their classrooms?
5. Do you encourage teachers to go for ICT related staff development courses and seminars?
6. Do teachers in this school prefer to use non-ICT based resources?
7. Do you think ICT enhances teaching in this school?
8. Do you think that the use of ICT fastens teachers' syllabus coverage?
9. Do you think ICTs help teachers deliver lessons efficiently?

10. What support have you received from the government in the implementation of ICT for teaching?
11. How much budget is allocated to the development of ICTs as tools for enhancing the teaching and learning process?
12. What percentage does this form to the total institutional/ school budget?
13. What is your main priority for developing teachers' ICT knowledge and skills?
14. What impact do you think the use of ICT has had in improving teacher efficiency?
15. What is the institution/ Ministry of Education's policy towards integration, implementation and use of ICTs as tools for the improving and development of the education sector?
16. What problems or challenges has your school faced in the acquisition and use of ICT as a tool for enhancing the teaching and learning process?

APPENDIX D

PEARSONS PRODUCT MOMENT CORRELATION

Correlations of all major variables

		Availability	User-ability	Accessibility	Efficiency
Availability	Pearson correlation	1	.458	.438	.268
	Sig. (2-tailed)	.	.000	.000	.016
	N	80	80	80	80
User-ability	Pearson correlation	.458	1	.625	.258
	Sig. (2-tailed)	.000	.000	.000	.010
	N	80	100	100	100
Accessibility	Pearson correlation	.438	.625	1	.407
	Sig. (2-tailed)	.000	.000	.	.000
	N	80	100	100	100
Efficiency	Pearson correlation	.268	.258	.407	1
	Sig. (2-tailed)	.016	.010	.000	.
	N	80	100	100	100