

**UTILIZATION OF INFORMATION AND COMMUNICATION
TECHNOLOGY ON MANAGEMENT OF PUBLIC SECONDARY
SCHOOLS IN TRANS NZOIA WEST DISTRICT, KENYA**

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the award of the Degree of Master of Education in Educational**

Administration

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DECLARATION

This research project is my original work and has not been presented for a degree in any other university or institution.

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DEDICATION

I dedicate this work to my husband, Mr. David K. Wafula and our children Yvette, Ydel and Shaine Kayaja. I also dedicate it to my parents Mr. and Mrs. Bernad Makwara.

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LIST OF ACRONYMS AND ABBREVIATION

ICT	Information and Communication Technology
KCSE	Kenya Certificate of Secondary Education
KEMI	Kenya Education Management Institute
KNEC	Kenya National Examination Council
MDGs	Millennium Development Goals
MOE	Ministry of Education
UNESCO	United Nation Education Security Council

ABSTRACT

This study investigated utilization of information and communication technology on management of public secondary schools in Trans Nzoia West District. The study was guided by four objectives: use of ICT on examination processing in management of public secondary schools, utilization of ICT on communication in management of public secondary schools, use of ICT in students' record keeping in management of public secondary schools and use of ICT in maintaining school accounts in management of public secondary schools in Trans Nzoia West District. A survey research design was adopted for the study. The target population was 74 secondary schools. A purposive sampling procedure was used where 30 secondary school with ICT facilities were incorporated in the study. Data was collected using questionnaires, interview guides and observation checklists. Data analysis was performed using SPSS for descriptive statistics and results presented in tables, frequencies and percentages. The study established that utilization of ICT facilities had a great impact in management of examinations, in enhancing communication, in storing student's data and in management of school accounts. Availability of ICT facilities made school registration of candidates for National Examination convenient. ICT had made communication to be cheap, fast and reliable. Utilization of ICT in management of students records enabled easier retrieval of information and reduced the bulkiness associated with manual files. ICT enhanced accountability and reduced workloads in management of school accounts. In view of the above findings the study recommends that schools through headteachers to sponsor more teachers for ICT training. The teachers service commission being the employer of teachers to compel institutions offering teacher education to have ICT training mandatory to all teacher trainees. ICT literacy should be a qualification for one to be appointed as a H.O.D, deputy principal or principal. The Ministry of education should set standards for management of schools, which incorporates ICT.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The use of information and communication technology (ICT) is having a great influence on management of secondary schools in Kenya in the recent years. Computers and sophisticated information systems are having enormous impact in organizations (Robbins, 1984). They are stimulating widespread changes in the required skill levels of employees, the daily activities of managers and organizations ability to changing needs of consumers. Public secondary schools as organizations are embracing use of ICT in their management.

Obiora (2010) defines ICT as a set of technological tools and resources used to communicate, create, disseminate, store and manage information. According to Outa (2006), ICT refers to landline and cellular telephones, wireless technologies, computers, internet, computer software and hardware, as well as older communication technologies such as radio. In this study ICT is used to refer to the use of database, internet and other computer applications in management of secondary schools.

Management is an integral part in the running a school. Hamel and Bill (2007) define management as the act of coordinating the efforts of people to accomplish desired goals and objectives using available resources effectively and efficiently. In this study management refers to the process of planning and controlling the

work of school members using available resources to achieve schools objectives. The work of school members include; examination management, communication, management of students' data, and management of school accounts. The available resources are the ICTS.

The Dakar Framework for Action has one of its strategies for countries in America and Europe as utilization of technologies in education (UNESCO, 2002). Information and communication technologies fulfill a crucial role in; administration, planning and management follow up of education policies and processes. Use of ICT in secondary schools is significant in the global context basing on the research conducted by Tearle (2004) in United Kingdom (UK) schools. The study focuses on the implementation of ICT in UK secondary schools. For successful implementation of ICT, attitude towards ICT, access and availability of resources and support training were some of the factors that influenced implementation of ICT in UK schools.

Singh and Munianchi (2012) found that one of the factors that made administrators in Malaysia schools to adopt ICT tools in their schools was the foreseen advantages such as easier communication by use of short messaging of services (SMS) or through emails for schools which had connected to the internet, schools e-learning portal and school websites. Regionally a research by Ziraba (2012) indicated that some schools in Uganda Central District had installed ICTs in their schools to support administration and management, ICT had contributed

to improvement of efficiency in record management, grading systems in schools and tracking students' academic progress. Menjo (2007) found that despite the challenges facing ICT integration in schools administration in Nandi North District, secondary school administrators and teachers view on ICT use in the schools was very positive. The teachers viewed that ICT shortened time to accomplish tasks and the quality of work was better than before.

The recent requirement by the Kenya National Examination Council (KNEC) of online registration of national examinations has posed a major challenge to secondary schools without ICT facilities (Choge, 2012). Many schools without ICT facilities have been forced to hire private services which are often expensive and usually characterized with delays and errors that have attracted hefty penalties from the examination council. Eyo (2012) notes that management secondary schools, is largely dominated by use of manual operational methods. Secretaries and typists with outdated typewriters are a common sight in most schools. The increase in school population, complex goals/objectives and resources within the school calls for better use of information system technologies.

1.2 The Statement of the Problem

The Kenyan Government commitment to the integration of ICT in education has been indicated through the development of a number of National policies on ICT. Farrel (2007) states that the M.O.E in 2006 introduced the ICT strategy for Education and Training. The document referred to as the ICT policy for education

sector. Objective 14 of this policy is the integration of ICT in education. To achieve this objective the ministry will employ strategies such as; improving ICT infrastructure in schools, equipping education institution with ICT equipment and to develop the capacities of education managers. The sessional paper NO 1 of 2005 has the strategy of facilitating universal access of ICT infrastructure in educational institutions. This has been partly achieved through the rural electrification program which targeted mainly schools in rural areas to enable them integrate ICTs.

Trans Nzoia West being a rural area is advantaged through the rural electrification programs. The availability of electricity has made more than fifty percent of secondary schools to install ICT either for administrative or learning purpose. Several studies have been conducted on ICT in management of secondary schools. Kipsoi(2012) conducted a study on challenges facing the Adoption of ICTs in Management of Secondary schools in Nandi District. Makhanu (2012) conducted a study on relationship between principals access to ICT and Performance in Western Kenya. Minimal research has been conducted on utilization of ICT on management of public secondary schools in a rural set up. Registration of candidates in Kenya is a purely online process, which calls for administrators to incorporate ICT in their schools. Ziraba (2012) found out that before the introduction of electronic computing, report cards were marred with errors such as missing marks which led to problems in grading systems and determining promotion in the next levels.

The study looked at the use of ICT on examination processing in management of public secondary schools, utilization of ICT on communication in management of public secondary schools, use of ICT in students' record keeping in management of public secondary schools and use of ICT in maintaining school accounts in management of public secondary schools in Trans Nzoia West District.

1.3 The Purpose of the Study

The purpose of the study was to investigate the utilization of ICT on management of public secondary schools in Trans Nzoia West District, Kenya.

1.4 Research Objectives

The study was guided by the following objectives

- i) To determine the use of ICT on examination processing in management of public secondary schools in Trans Nzoia West District.
- ii) To examine the utilization of ICT on communication in management of public secondary schools in Trans Nzoia West District.
- iii) To establish the use of ICT in students' record keeping in management of public secondary schools in Trans Nzoia West District.
- iv) To examine the use of ICT in maintaining school accounts in management of public secondary schools in Trans Nzoia West District.

1.5 Research Questions

The study was guided by the following research questions

- i) How does the use of ICT on examination processing enhance the management of public secondary schools in Trans Nzoia West District?
- ii) How does the use of ICT in communication enhance management of public secondary schools in Trans Nzoia West District?
- iii) How does ICT use in keeping students' records enhance management of public secondary schools in Trans Nzoia West District?
- iv) To what extent is ICT utilized in maintaining school accounts to enhance public secondary schools in Trans Nzoia West District?

1.6 Significance of the Study

The study may enable the Ministry of Education to identify the need to train principals on ICT through the Kenya Education Management Institutes (KEMI). At the school level head teachers may identify the need for capacity building for teachers on ICT. Parents may benefit from implementation of ICT because they may be able to track the performance of their children. The Board of Management, Parents Teachers Association and School Sponsor may track schools performance, discipline of students and teachers by assessing information easily through computers. The study may provide data for researchers in future especially on use of new technologies in management of schools.

1.7 Limitations of the Study

The limitation of the study was that, respondents gave responses that favored their situation for purposes of safeguarding their self interest. The researcher addressed this by using observation method to ascertain the authenticity of the information given and the availability of ICT infrastructure in their institutions. The researcher also assured them of the confidentiality of all the information provided. The study was conducted in one district only; the researcher related the information received with other studies on the same topic conducted in other districts.

1.8 Delimitations of the Study

The study focused on public secondary schools in Trans Nzoia West District which had incorporated ICT in their management. Schools in the urban set up were involved because they had the advantage of long usage of ICTS. Schools in the rural setup were also involved after benefiting from the recent rural electrification program which had enabled them to integrate ICTs. The respondents included school principals and teachers' in-charge of ICT.

1.9 Assumptions of the Study

The study assumed that all respondents would give accurate information on the use of ICT in examination processing, communication, record keeping of students' data and financial management. That is;

- i) They were able create a student's database and fill in information needed for registration of candidates for National Examination.

- ii) They were able to use computer software such as the word to prepare internal examinations and prepare communication correspondence to parents
- iii) They were able to use the financial management software to manage their school accounts.

1.10 Definition of Significant Terms

The following were the significant terms used in the study on the influence of ICT on Management of Public Secondary Schools

Communication refers to the transmission of information within or without the school.

Computer laboratory refers to a room set aside for storing and utilization of computer equipments.

Examination processing refers to the preparation of internal tests, marking of tests, analysis of the tests, as well as registration of candidates for external tests.

Hardware refers to computer equipment such as the keyboard, mouse, monitor, scanner and printer.

Infrastructure refers to the physical building and other structures that house computers in the school.

Intranet refers to the internal network set up by the school to share data online.

Management refers to the process of planning and controlling the work of school members using available resources to achieve the school set goals.

School accounts refer to the fee registers, cash books, receipt books, ledger books and budgets that are kept in a school.

Student records refer to the information on gender, entry marks, next of kin, health matters and academic progress record.

Software refers to the programs installed in a computer which instructs a computer to carry out functions such as typing, storing and processing of school information.

Student database refers to an integrated collection of students information consolidated to a common pool that provides data for one or multiple use.

1.11 Organization of Study

The study is organized into five chapters. The first chapter contains the background to the study, statement of the problem, the purpose of the study, the objectives of the study, research questions, significance of the study, limitations of the study, delimitations of the study, assumptions of the study and definition of significant terms. The second chapter reviews the literature related to the topic under the following subheadings: Introduction, the concept of ICT in education management, use of ICT on examination processing in management of public secondary schools, utilization of ICT on communication in management of public secondary schools, use of ICT in students' record keeping in management of public secondary schools and use of ICT in maintaining school accounts in management of public secondary schools, the theoretical framework and the conceptual framework. The third chapter highlights the research methodology

with the following subheadings research design, target population, sample size and sampling techniques, validity of the instruments, reliability of the instruments, data collection procedure and data analysis. The fourth chapter contains the data analysis, interpretation and discussions. Chapter five comprises the summary, conclusions, recommendations and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introductions

The chapter reviews literature related to the topic under the following subheadings: the concept of ICT in education management, use of ICT on examination processing in management of public secondary schools, utilization of ICT on communication in management of public secondary schools, use of ICT in students' record keeping in management of public secondary schools and use of ICT on school account in management of public secondary schools, the theoretical framework and the conceptual framework.

2.2 The Concept of ICT in Management

The concept of ICT is relatively new in the developing countries where majority of countries in the sub-saharan Africa are lagging behind in this information revolution (Zhao and Frank, 2003). As a result of this, many people are missing out on a better and well managed education system. ICT has played an important role in improving management in education systems through availing data to parents and public through the central administration websites. Today most countries include ICT integration in education is their national policies. In countries like Malaysia, national government has set goals for ICT integration in education.

2.3 Use of ICT on Examination Processing in Management Schools

One of the important areas of examinations processing is the registration of students for national examinations by head teachers, a duty that is mostly delegated to teachers in-charge of ICT and class teachers. Eyo (2012) states that strong changes were being experienced in examinations bodies in Nigeria. He states that the Joint Admissions and Matriculation Board and National Education Certificate Examinations were being checked online. The registration of the Kenya Certificate of Secondary Education is an online process with no paper work involved. The KNEC website gives the summary of the steps involved; visiting the KNEC Websites, downloading the candidates' registration application, filling the candidate details to create the registration file.

Candidates photographs taken by a digital camera must also be uploaded to the KNEC websites prior to the registration time. The examination registration software used for this purpose is the Window XP, Microsoft office. After successful registration candidates are expected to verify their registration details to avoid any inconveniences such as subject mix ups. The KNEC results at the moment can be accessed online or via SMS after official release. Giuri (2008) notes that, the era of long waited results is over with ICT presence. This calls for schools to have their own computers and the software which enables them access the KNEC website as need arises. Internal examination processing involves preparation school examinations, keeping examination questions and marks. It

also involves release of instructional outcomes (Matovu, 2012). Accessibility to ICT facilities ensures accuracy, timeliness and effectiveness of managing the whole process of examination; it allows easy flow of information and monitoring systems that are appropriate. Matovu (2012) found out that, keeping students ranks electronically reduced loss of the marks. The students interviewed showed that ICT facilities enhanced proper recording and keeping of examination results. Most secondary schools today do have series of tests which are averaged at the end of term or year. This demands proper way of storing the marks to avoid any losses.

The word 2002 is software that can be utilized in the preparation of examinations. The excel 2002 is an electronic worksheet used to organize, manipulate and graph numeric data (Oleary, 2006). Teachers can use this software to type set examinations record, grade and calculate final grades. A student database can be created using the access 2002 software with columns showing admission number, name, and class, type of exam, score and average score. The examination data base shows the entry of marks for various examinations as students sits for in a given term as illustrated in Table 2.1

Table 2. 1 Students Examination Database

Adm. No.	Name of Student	Class	Exam one	Exam two	Average Score
324	Maria Cherop	Form(ii)	33	50	42

The students' examination data base is useful in calculating the value added progress of a student as well as his/her performance trend. Ziraba (2012) found that before introduction of electronic computing, report forms used to be marred with errors such as missing marks which led to problems in grading systems and determining promotions to the next level. Matovu (2012) found out that teachers too could utilize ICT in preparation of examinations for example typing, storing and keeping examination questions. Obiora (2010) also discussed the institutional examination management software which aids in mark sheets preparation. ICT facilities, ensures proper grading of students. The marks can be compared from various examinations and can be shown through graphical representation.

2.4 Utilization of ICT in Communication in Management of Schools

Mbiti (2006) states, that the onset of information super highway at the close of 20th century brought a major global revolution to the field of communication. The revolution introduced services such as internet, e-mail and mobiles which have improved communication particularly in the rural areas of developing countries. These new communication methods have a great impact on education.

Communication is essential for working in secondary schools. Communication between teachers and students, between teachers and parents and among teachers serves to support students as they navigate high school and plan for their future. Telem (2001) conducted a study in schools in Hougang, North zone of Singapore and found out that ICT helped in streamlining administrative process in the area of communication. Obeng (2004) as quoted by Eyo (2012) was of the opinion that use of internet and intranet besides reducing administrative costs also reduces administrative inconveniences because same information could be sent to all department without having to do it individually. ICT is effective in eradication of distortion, duplication of information thus enhancing effective communication.

Eyo (2012) noted that the use of ICTs dramatically increased the speed of communication in organization. Intranet is an internal network set up by an organization to share data online (Oleavy, 2006). This enables communication to go on within the organization without involving physical movement. The intranet enables faster delivery of information to different departments. It also reduces distortions and duplication of information. Eyo (2012) observes that, communication can be greatly enhanced by the use of internet, intranet and extranet. In his study he found out that, secondary school administrators effectiveness in communication was related to and predicted by the use of ICT.

Oleavy (2006) notes that computer software such as the Microsoft Office XP has a suite of applications that can be used individually or can be designed to work together. The applications include tools used to create discuss and communicate. The word processor is software whose purpose is to create text based documents such as letters, reports, memos, emails, messages and any other type of correspondence. School managers can utilize this software for communication purposes. Head teacher can prepare newsletters to parents, internal memos to teachers, reports to education officers using this software.

Institutional administration system is software which makes communication easy with all the stakeholders; administrators, teachers, students, parents and the government, (Obiora, 2012). Teachers can easily access significant student's information, generate reports, collaborate with other educators or develop lesson plans easily. Parents can view or be alerted of absences, grades assigned to students. Students can access reports on their grades and general performances in a school. This software uses Microsoft windows which does not require heavy amount of staff training.

2.5 Use of ICT in Student Records Keeping in Management of Public Schools

According to Okumbe (2001) student personnel services deals with elaborate programs of students accounting, maintenance of records, reporting of all information to various agencies, students progress, racial and sex data for affirmative action and projections of student enrolments. This therefore calls for

establishing and maintaining a system of record keeping. Beta (2003) as quoted by Kipsoi (2012) indicate that ICT has played an important role in management in educational systems through availing data widespread to parents and the public at large through central administration website and in some cases through direct access to central database by school personnel. Kipsoi (2012) notes that, ICT can be valuable for storing and analyzing data on education indicators.

Devon (2004) as quoted by Matovu (2012) states that recording data electronically, storing it, controlling and sharing it with colleagues are vital to reducing workloads through available ICT structures. This calls for secondary school administrators to integrate ICT in their managerial system. The introduction of Free Primary Education in 2006 (FPE) and subsequently the Secondary subsidized Education has made schools to receive a large number of students thereby generating a lot of data. Mbiti (2007) states that for educational planners to succeed they need a lot of assistance and co-operation from institutional heads, classroom teachers and field officers in providing reliable data regarding the current education in the nation.

The data includes enrolment statistics, statistics on teacher numbers, completion rates, transition rates and retention rates. Head teachers and class teachers need to have techniques of processing the same data, (Mbiti, 2007). The student management system is basically a student information system. Student

information such as admission attendance, grading, discipline and family information is efficiently managed through this system. The data of a student can be accessed by just feeding in the admission number of the student. Okumbe (2001) notes that data on days present, days absent, credit earned, health problems need to be established and maintained. The main advantage of a computerized data base is the ability to quickly add, delete and locate specific records. Creation forms make it easier to enter and edit data as well. According to Mdlongwa (2012), ICT will make routine tasks such as accessing pupils' records much faster than before. He notes that previously, loads of files would be kept containing pupils school records and one had to physically look through all of them just to find information. Record keeping becomes more orderly and reliable, manual records used in the past could be lost due to poor filing. Finally administrative costs of photocopying are lowered and less paper wasted. Access 2002 software can be used to generate a student's information database to replace the admission registers. This becomes useful when old students write back to schools for letters of recommendation for certain appointment.

2.6 Use of ICT in Maintaining School Accounts on Management of Schools

According to Mbiti (2007), the concept of managing school accounts differs from that of keeping school accounts .Management of school accounts is the responsibility of school administrator. It involves budgeting and supervision of officers who keep the school accounts. Okumbe (2006) states that management of

school accounts is concerned with preparation of school budget and monitoring expenditure which is basically involved with maintenance of appropriate record keeping, accounting and auditing procedures. ICT can help managers to retrieve, evaluate information in relation to budgets. Budget making begins with formulating some fundamental assumptions that are pertinent to the institution which must be derived from the past experiences on the schools financial position (Mbiti, 2006). Review of previous year's budget is important. Did the school overspend? If so, in which vote heads? Administrators will identify the above issues with ease if the financial records are computerized. School enrolment is important during the budget making process. Students' databases will provide the information of the enrolment rate of that year and the projections for the coming year. A budget is a management tool as well as a planning tool. School managers can utilize it well when it is captured and stored in a computer.

Management of school records also entails supervision of officers who keep the school accounts. Secondary schools usually employ accounts clerks to do this work under the supervision of head teachers. Several accounting documents are kept by these officers. These include the fees registers, cash books, petty cash books, accounts records registers and receipt books, (Mbiti, 2006). Maintaining these books of account maybe cumbersome especially with a large student population. ICT software and financial databases will improve efficiency in maintaining the books of accounts. Supervision by head teachers will also be

easier with ICT. Preparation of final accounts for auditing can be done using computers. Income and expenditure statements and the balance sheets preparation can utilize computers and hence reduce the anomalies associated with manual systems.

2.7 Summary of Literature Review

The reviewed studies have established that utilization of ICT has a positive influence on the four aspects of management under investigation in this study. ICT plays a crucial role in management of secondary schools. Ilomaki (2009) observes that ICT can be used to manage information more efficiently resulting to better organization and administration. ICT makes both internal and external examinations work easier. ICT facilities enhance proper recording and keeping of students assessed work. It is valuable for storing and analyzing data on education indicators and students assessment. Communication is crucial in any organization; ICT ensures that the right information is transferred to the right person within the shortest period of time. Financial management in a school demands for better and modern ways, ICT becomes a necessary tool in ensuring better financial management.

2.8 Theoretical Framework

This study is guided by the Open Systems Theory. The theory was initially developed by Ludwing Von Bertalanffy in 1956. The theory defines the concept of a system where all systems are characterized by an assemblage or combination

of parts whose relations make them interdependent. Okumbe (2001) states that open systems have three basic characteristics: they receive inputs from the environment; they convert these inputs and discharge their outputs into the environment. Secondary schools are indeed open systems. Such inputs in a school which make up a system include technologies, people, infrastructure and school departments. These inputs go through processes where they are planned and organized to meet the schools desired standards in which if ICTs were effectively integrated would coordinate these inputs.

The school as an open system is highly influenced by the environment (Bastedo, 2004). The environment here will include availability of finances which will avail the ICTs. Environment includes the people who have necessary skills to use ICT and be willing to incorporate the same. Okumbe (2001) states that, a key feature of open systems is their interdependence with the environment, which may be relatively stable or uncertain. The theory was preferred due to its all encompassing nature that gives a picture to the utilization of ICT in managing various departments of a school.

2.9 Conceptual Framework

According to Ogula, (1998) conceptual framework is a description of the main independent and dependent variables of the study and the relationship among them. Dependent variables are conditions that appear to change as the

independent variables are introduced or removed. The dependent variable was management of secondary school which is represented in Figure 2.1

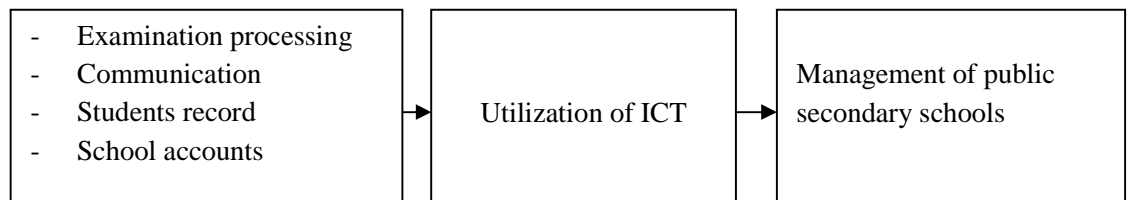


Figure 2.1: The Conceptual Framework

The dependent variable was management of secondary schools which was dependent on ICT. The conceptual framework shows how use of ICT to manage examinations, facilitate communication, store students data and in management of school accounts will lead to; efficiency in examinations processes, efficiency in tracking students records, availability of students data, reliable and instant feedback in communication and reduced workloads in management of school accounts.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter contains the research methodology under the following subheadings: research design, target population, sample size and the sampling techniques, validity of the instruments, reliability of the instruments, data collection procedure and data analysis.

3.2 Research Design

A research design is the overall plan for obtaining answers to the question being studied. The design helps one to perform the chosen task easily and in a systematic manner (Rajasekar, 2006). To achieve the objectives and address the problem under the study the descriptive survey design was used to conduct the research. A descriptive survey design attempts to picture or document current conditions or attitudes. It describes what exists at the moment. The design has this advantage; a large amount of data can be collected with relative ease from a large population

3.3 Target Population

Kombo and Tromp (2006) define population as a group of individuals, objects or items from which samples are taken for measurements. Target population is the entire group a researcher is interested in. According to the District Education

Officer, Trans Nzoia West District has 74 public secondary schools. Out of this only 30 schools are ICT compliant. The target population is all the 30 secondary schools with ICT, 30 principals and 30 teachers in charge of ICT.

3.4 Sample Size and Sampling Techniques

A sample population is a proportion of the entire population under study .A purposive sampling procedure was used for the case of this study. Only population with ICT facilities was selected. Out of the 74 public secondary schools, 30 schools were ICT compliant. In determining the sample size for this study the researcher used the table by Krejcie and Morgan (1970) as shown in appendix vii. According to the table out of 30 headteachers, 28 were selected, and out of 30 teachers’ in-charge of ICT 28 were selected as illustrated in Table 3.1.

Table 3.1 Sample Size

Category	Target Population	Sample Size
Schools	30	28
Principals	30	28
Teachers in charge of ICT	30	28
Total	90	84

3.5 Research Instruments

Research instruments are tools used to collect the data. The study used a **questionnaire** which was given to teacher’s in-charge of ICT and the head

teachers. A questionnaire has this advantage, it is more efficient in that it requires less time and is less expensive to administer (Orodho. 2005). It was relatively quick to collect information using a questionnaire. The questionnaire had both closed and open-ended items covering the respondents' backgrounds and utilization of ICT in their management.

The study used **interviews guides**. Interviews improve on the understanding and the credibility of the study; they lead to a deeper understanding of the topic (James, 1997) as quoted by Ziraba 2012. Interviews were conducted with all the principals. The interview questions helped to supplement the data collected through the questionnaires.

An **observation checklist** was used to ascertain the availability of ICT and the related infrastructure. An observation checklist is recommended for its provision of first hand information (Adim. 2005). The checklist proved useful in gathering information on availability of ICT facilities and its usage as responded in the questionnaires.

3.6 Validity of the Instruments

Mugenda and Mugenda (2003) define validity as the accuracy and the meaningfulness of inference which are based on research results. It is the degree to which results obtained from one analysis of data actually represent the phenomena under study .Instrument validity was measured through triangulation.

Multiple methods such as observation, interviews and questionnaires led to more valid, reliable and diverse construction of realities (Golafshani, 2003). The pilot study helped to check that the instructions given to respondent were comprehensible. Ambiguities were cleared according to the results of the pilot study.

3.7 Reliability of the Instruments

Mugenda and Mugenda (2003) define reliability as the degree to which a research instrument gives consistent results or data after repeated trials. The test –retest method was used to measure the reliability of the instruments. In the pilot study the questionnaire were administered twice to the same group of respondents. The Product moment correlation coefficient was used compute the reliability of the instrument

$$r = \frac{N \sum XY - (\sum X) (\sum Y) N}{\sqrt{N \sum X^2 - (\sum X)^2} \sqrt{N \sum Y^2 - (\sum Y)^2}}$$

- Where X = Odd score
 Y = Even score
 $\sum X$ = Sum of even numbered scores
 $\sum Y$ = Sum of odd numbered scores
 N = Number of paired scores

According to Spearman, if the value is between 0 – 1, then the instrument is said to be reliable. The r value computed was 0.83 for teachers in-charge of ICT and 0.82 for principals; hence the research instruments were reliable.

3.8 Data Collection Procedure

The researcher obtained a research permit from the National Council for Science and Technology after which she presented it to the DC and DEO Trans Nzoia west district for clearance to commence the study. The researcher then made introductory visit to the schools of study, and on the agreed date the researcher distributed the questionnaires for filling and collected them later. The interviews were conducted on the agreed dates. The observations were done after the interviews. An observation list was used to ascertain the availability of the ICT infrastructure and facilities in schools.

3.9 Data Analysis

Data analysis involves cleaning up, reduction, differentiation and explanation. Qualitative data from interviews was analyzed as the study progressed following a logical analysis. This was done through identification, examination and interpretation of patterns and themes. Quantitative data was analyzed using descriptive statistics through the statistical package for social sciences. The data was recorded as frequencies (N) and percentages (%) and presented in tables, bar graphs and pie charts.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

This chapter presents a detailed analysis of the research findings followed by the interpretation of the same. The study sought to assess the utilization of information and communication technology on management of public secondary schools in Trans Nzoia West District. The chapter focuses on the questionnaire return rate, demographic information of principals and heads of departments, presentations and interpretation of findings on the objectives of the research: use of ICT on examination processing in management of public secondary schools, utilization of ICT in communication in management of public secondary schools, use of ICT in students' record keeping in management of public secondary schools and use of ICT in maintaining school accounts in management of public secondary schools in Trans Nzoia West District.

4.2 Questionnaire Return Rate

Questionnaire return rate is the percentage rate of the questionnaires that were returned to the researcher and which were well completed for the sake of analysis. In this study out of the 28 questionnaires issued to teachers in-charge of ICT, 23 (82%) were returned and out 28 questions issued to the principals, 23 (82%) were returned.

4.3 Demographic Data

It was necessary for the study to gather data on the teachers' in-charge of ICT background in terms of age, gender and academic qualification. These would directly or indirectly influence their willingness to have integrated ICT in management of their schools. The data was summarized as follows:

4.3.1 Gender of Respondents

Gender of respondents may influence the readiness and willingness to incorporate ICTs in management. Data on gender of principals and teachers' in-charge of ICT was collected and shown in Table 4.1.

Table 4. 1 Gender of Respondents

Gender	Principals		Teachers in-charge of ICT	
	F	%	F	%
Male	15	65	21	91
Female	8	35	2	9
Total	23	100	23	100

From Table 4.1 it is evident that the higher proportion of principals (65%) and teachers in-charge of ICT (91%) were male from the findings of the study, it is evident that male teachers were more involved in utilizing ICT in management of secondary schools. Menjo and Boit (2007) in their study noted that male teachers used computers more often than female teachers.

4.3.2 Age of Principals and Teachers in-charge of ICT

Age of Principals shows maturity and experience and this may influence the willingness to adapt to ICT. The age of teacher's in-charge of ICT may show the desire to embrace the new technologies in management. It was therefore necessary to ask the age of respondents. The data on age of respondent was collected and is shown in Table 4.2

Table 4.2 Distribution of the Respondents by Age

Age Bracket	Principals		Teachers in-charge of ICT	
	F	%	F	%
30 – 40 years	0	0	22	95%
40 – 50 years	20	87	1	5%
Above 50yrs	3	3	0	0
Total	23	100	23	100

Table 4.2 indicates that principals in age bracket 40 and above years (87%) have enough experience in management and hence saw the need to incorporate ICT in the management. However younger teachers (95%) between ages 30- 40 years were more involved in using ICT. This could be due to the fact that new technologies are easily accepted by the young generation. Makhanu (2012) in her study noted that middle aged teachers were more ICT literate than older ones from 50 and above.

4.3.3 Principals and Teachers Highest Academic Qualifications

The highest academic qualifications of principals and teachers in-charge of ICT would influence the desire to integrate ICTs in school management. ICT use calls for skilled personnel in a school. The data on headteachers and teachers in charge of ICT highest academic qualifications was collected and is shown in Table 4.3

Table 4.3 Principals and Teachers Highest Academic Qualifications

Qualification	Principals		Teachers in-charge of ICT	
	F	%	F	%
M.Ed degree	5	12	1	0.4
B.Ed degree	18	78	20	87
Diploma	0	0	2	09
Total	23	100	23	

Table 4.3 shows that most principals (78%) had at list B.Ed. degree as their level of academic qualifications hence the positive move towards integration and use of ICTs in management. The head teachers together with other teachers involved in management must be well trained to integrate ICT in schools. Makhanu (2012) noted that education level correlates positively with ICT literacy.

4.3.4 The Length of Time Schools Had Computers

The length of time schools had computers reveal the extent of usage. Data was collected on the length of time schools had computers and is shown in Table 4.4.

Table 4.4 Length of Time Schools had Computers

Length of Time	Frequency	Percent
less than one year	3	13.0
2-4 years	12	52.2
4- 8 years	5	21.7
above 8 years	3	13.0
Total	23	100.0

Table 4.4 shows how long schools had computers. The number of schools that had computers for 2-4 years was the highest, at 52.2%, followed by the schools which had computers for 4-8 years, at 21.7%, then by schools which had computers for less than one year, at 13%, and schools which had computers for more than 8 years, also at 13%. Schools which had computers for a short time utilized computers in limited areas such as examinations only. Kitoo (2012) observed that schools which had computers for over 10 years used ICT in almost all the management aspects of the school.

4.3.5 Percentage of Teachers with Access to School Computers

The percentage of teaching staff accessible to computers is important as it may determine the extent of usage in various aspects of management. The data on percentage of teachers with access to computers was collected and is shown in Table 4.5

Table 4.5 Percentage of Teachers that had Access to School Computers

Teachers access to computers	Frequency	Percent
about 10%	5	21.7
about 20%	5	21.7
about 50%	8	34.8
above 75%	5	21.7
Total	23	100.00

Table 4.5 shows the percentage of teachers that had access to school computers. 34.8% of respondents said that about 50% of teachers had access to the school computers; they were followed by 21.7% of respondents who said that about 10% of teachers had access, then by 21.7% of respondents who said that about 20% of teachers had access, and also 21.7% who said that about 75% of teachers had access to computers. Few teachers who deal with examinations are the ones accessible to computers. According to Menjo and Boit (2007) computers located in the staffroom area would be accessed by more teachers. In this study many computers were located in the secretary's offices or teachers' in-charge of ICT offices which limited the accessibility of computers to some teachers.

4.4 Use of ICT on Examination Processing in Management of Schools

Examination management in secondary schools involves registration of candidates for national examination, preparation of internal exams and analysis of

examination results. Data was collected on how schools registered for national examinations, influence of ICTs on examination management and the benefits of ICTs on examination registration and analysis.

4.4.1 Registration of Students for KNEC Examinations

Registration of candidates for national examination can be done in school if the school has the facilities or may be done by hiring services outside the school. It was therefore necessary for the study to find out how schools registered the students for national examinations. 100% of schools registered students for the examinations using their own ICT facilities. All schools visited indicated that they registered their students for national examination with their own facilities in schools. All principals' response through interviews on examination registration revealed that the registration of candidates for national examination was done in school with their own facilities. Choge (2012) found out that schools without ICT facilities experienced a lot of challenges during the registration process.

4.4.2 Benefits Derived from Using ICT in Examination Registration

Use of ICTs benefits the schools in several ways .It was important to find out the benefits of ICTs in examination registration. The data was collected and is shown in Figure 4.1.

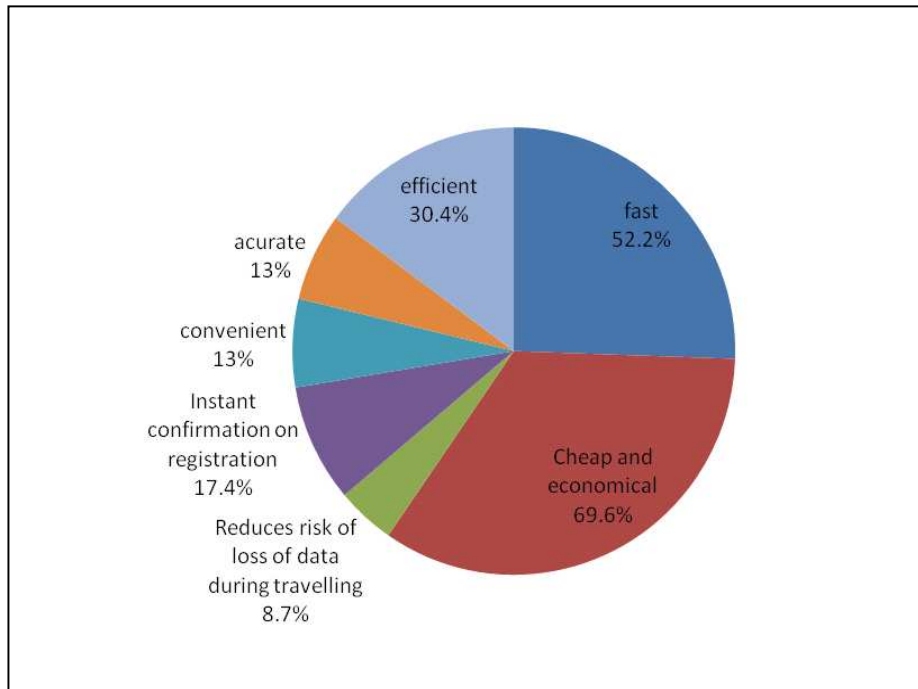


Figure 4.1 Benefits Derived from Using ICT in Examination Registration

Figure 4.1 shows the benefits derived from using ICT in examination registration. The most mentioned benefit was that ICT was cheap and economical, at 69.6%, followed by speed, at 52.2%, then by efficiency, at 30.4%, then by instant confirmation of registration, at 17.4%, then by convenience, at 13%, and accuracy at 13%, then by reduced risk of loss of data during travelling. Most principals agreed that availability of ICT in schools was cheap, fast and enabled them to get instant confirmation on registration. Menjo (2007) observes that ICT use shortened time to accomplish tasks and the quality of work was better than before.

4.4.3 Influence of ICT in Examination Management

Use ICT has an impact on examination management. Use of computers to store students scores reduced the loss of marks hence it was easy to track the students

progress. Respondents were asked to indicate if they strongly agreed, agreed, disagreed, strongly disagreed or even undecided about statements about the influence of ICT in examination management. The data was collected and shown in Figure 4.2

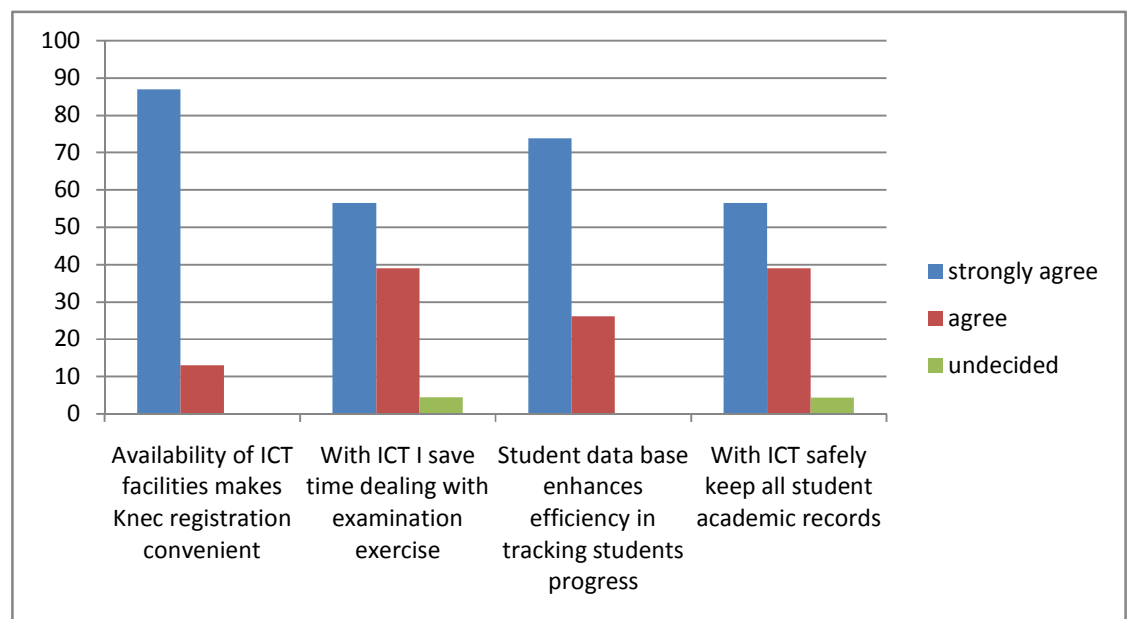


Figure 4.2 Influence of ICT in Examination Management

Figure 4.2 shows show opinion on the influence of ICT in examination management. Availability of ICT facilities makes KNEC registration convenient; most teachers' in-charge of ICT strongly agreed with this statement, at 87%, followed by those who agreed at 13%. With ICT I save time dealing with examination exercise; the number of people who strongly agreed with the statement was the highest, at 56.5%, followed by those who agreed, at 39.1% and those who were undecided, at 4.4%. The number of people who strongly agreed that student data base enhances efficiency in tracking students' progress was the

highest, at 73.9%, followed by those who agreed, at 26.1%. With ICT it is possible to safely keep all student academic records; 56.5% of people strongly agreed with this statement, 39.1% agreed while 4.3% were undecided. Most principals were of the opinion that ICTs had a great impact on examination management. Matovu (2012) observed that ICTs played an important role in keeping academic records hence it was easy to track both students and school performance.

4.4.4 Influence of Computer Software in Various Aspects of Management

Computer software influences management of examinations in various ways. Respondents were asked to rate the influence of computer software on various aspects of management as; high impact, moderate impact, little impact and no impact. The results are shown in Figure 4.3

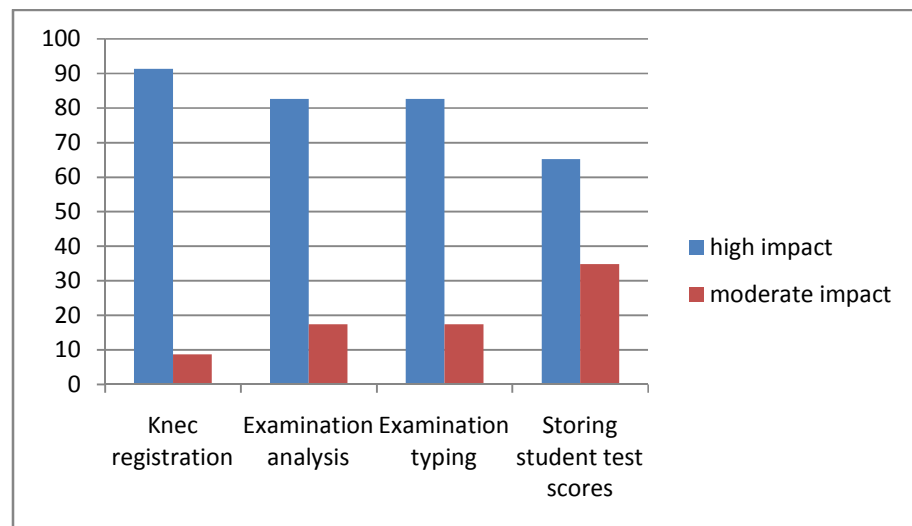


Figure 4.3 Influence of Computer Software in Various Aspects of Management

Figure 4.3 shows opinion on the influence of computer software in various aspects of management. 91.3% of people agreed that computer software had a high impact on KNEC registration while 8.7% said that computer software had a moderate impact. 82.6% of people said that computer software had a high impact on examination analysis compared to 17.4% who said it had moderate impact. 82.6% of people said that computer software had a high impact on examination typing compared to 17.4% who said it had moderate impact. 65.2% of people said that computer software had a high impact on storing student scores compared to 34.8% who said it had moderate impact. From the figure 4.3, computer software had the highest impact on KNEC registration, at 91.3%, then examination analysis, at 82.6%, examination typing, at 82.6%, and storing students' test scores, at 65.2%. Kitoo (2012) found out that computer software had a great impact on examinations analysis and preparation of tests

4.4.5 Benefits Derived from Using ICT in Examination Analysis

Use of ICT in analysis of examination will benefit the schools in various ways. It was important for the study to establish the benefits accruing from using ICT to analyze examinations in schools. The researcher collected data and presented in Figure 4.4.

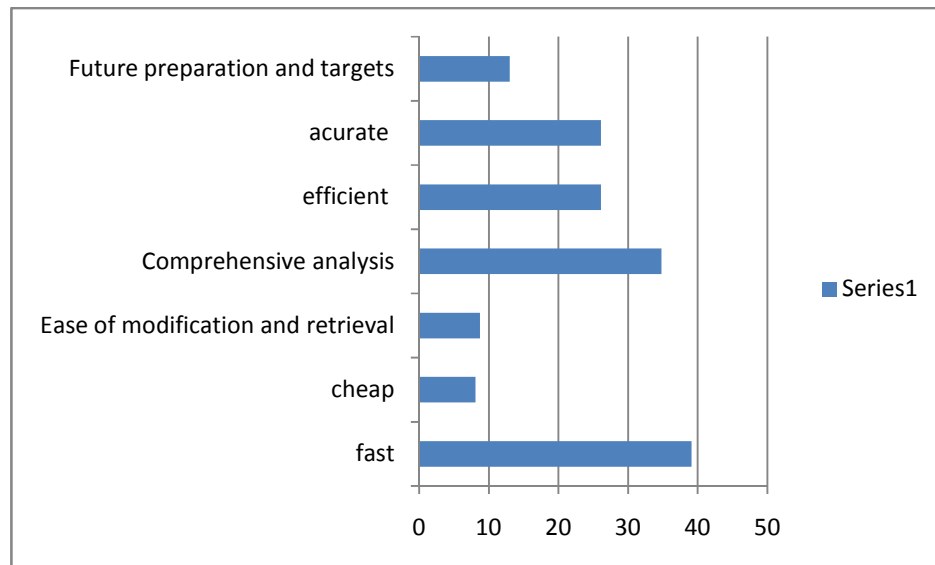


Figure 4.4 Benefits Derived from Using ICT in Examination Analysis

Figure 4.4 shows benefits derived from using ICT in examination analysis. The most common benefit was the speed, at 39.1%, followed by ability to analyze data comprehensively, at 34.8%, then by efficiency, at 26.1%, and accuracy, at 26.1%, then by ability to make plan and set targets, at 13%, then by ease to modify and retrieve data, at 8.7%, and affordability, at 8.1%. ICT use in examination analysis enabled schools to have a comprehensive analysis of examinations and the process was faster.

4.5 Utilization of ICT in Communication in Management of Schools

Communication in a school entails use of mobile phones, internet and PowerPoint to exchange information with students, parents, members of staff and other stakeholders. The study looked at the availability of ICTs for communication in schools, their extent of use, and their benefits to the schools.

4.5.1 Availability of Internet, PowerPoint and Mobile Phones in School

Internet, PowerPoint and sms are some of the ICT resources used for communication in school. The study sought to find out the availability of the above resources in schools and the data is shown in Table 4.6

Table 4. 6 Availability of internet, PowerPoint and Mobile Phones in School

	Internet	Percent	PowerPoint	%	Mobile phones	%
Yes	18	78.2	10	43.5	21	91.3
No	7	21.7	13	56.5	2	8.7
Total	23	100	23	100	23	100

Table 4.6 shows the availability of internet, PowerPoint and mobile phones in school. The use of mobile phones was the most available, at 91.3%, followed by internet, at 78.2%, and PowerPoint, at 43.5%. 8.7% of schools did not use mobile phones, 21.7% of schools did not use internet while 56.5% of schools did not use PowerPoint. Majority of principals agreed that use of mobile phones for communicating to parents was a common phenomenon. Makhanu and Kamper (2012) revealed that most schools accessed internet though wireless networks as well as through mobile phones.

4.5.2 Benefits of Using Short Message Services to Communicate to Parents

Use of SMS for communication has several benefits. The study established the benefits of SMS use in communicating with parents. The data was collected and is shown in Figure 4.5

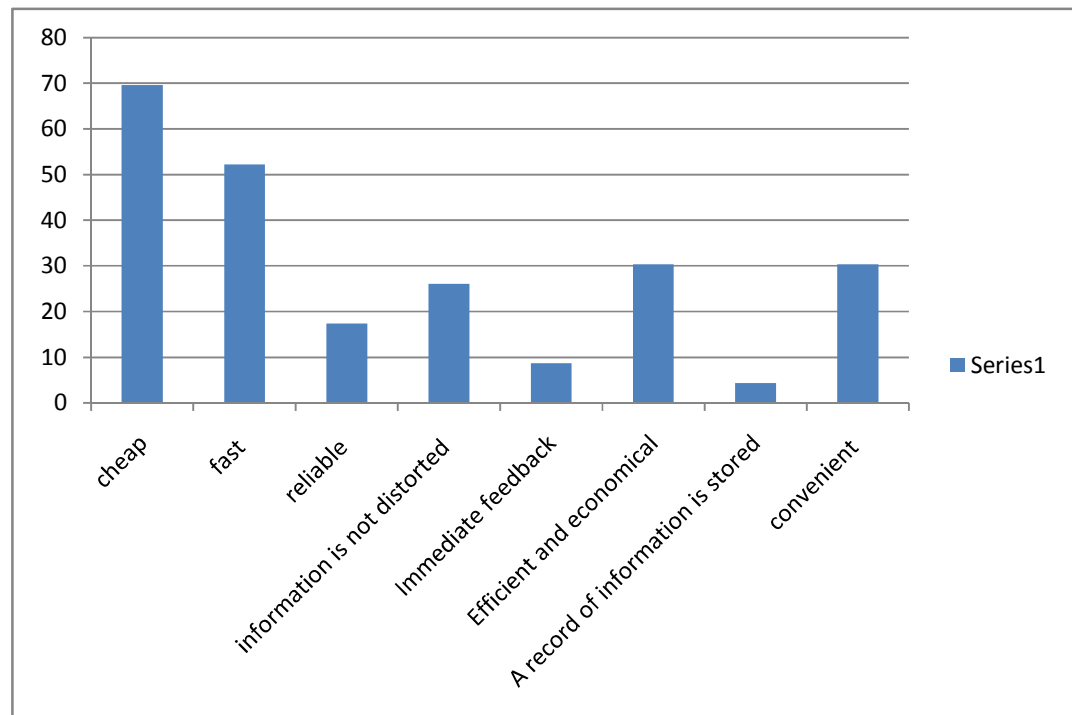


Figure 4.5 Benefits of using SMS to Communicate to Parents

Figure 4.5 shows the benefits of using SMS to communicate to parents. The most common benefit of using SMS to communicate to parents was affordability, at 69.6%, followed by speed, at 52.2%, then by efficiency at 30.4%, and convenience, at 30.4%, then by reduced risk of distortion of information, at 26.1%, then by reliability, at 17.4%, then by ability to get immediate feedback, at 8.7%, and the ability to keep a record as proof of communication, at 4.3%. Most principals agreed that SMS are cheaper and fast to communicate to parents Kipsoi

(2012) notes that ICTs promotes communication among schools and parents thus fostering accountability public support and connectivity.

4.5.3 How ICT has Enhanced Communication

ICT enhances information in several ways. It was important to find out how ICT had enhanced communication in schools. The data collected was presented in Figure 4.6

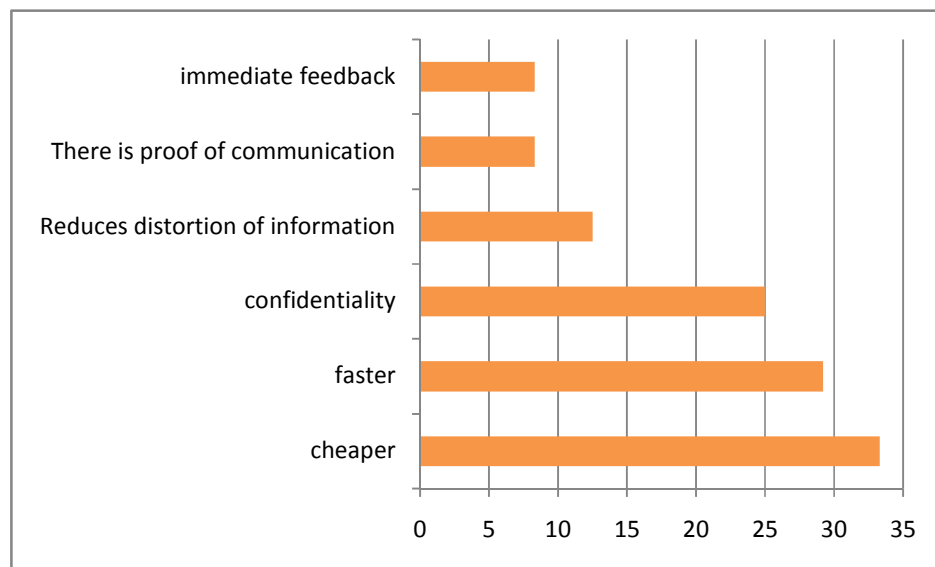


Figure 4.6 How ICT Enhanced Communication

Figure 4.6 shows how ICT has enhanced communication. The most common way through which ICT enhanced communication was the affordability, at 33.3%, followed by speed, at 29.2%, followed by enhanced confidentiality, at 25%, then by reduced distortion of information, at 12.5%, then by provision of proof of information, at 8.3%, and immediate feedback at 8.3%. Obeng (2004) as quoted

by Eyo (2012) observed that ICT was effective in eradicating distortion and duplication of information and therefore agrees with the study.

4.6 Use of ICT in Students Record Keeping in Management of Schools

Use of ICT to store students' data is widespread among many schools. The study established whether schools used ICT to store their students' records. It also sought to find out the types of data stored as well as the benefits of storing the data in computers.

4.6.1 Use of ICT Facilities in School to Store Students' Data

ICT facilities in school can be used to store student's records. The study established if the students' records were stored in ICT facilities in school. Data was collected and is shown in Figure 4.7

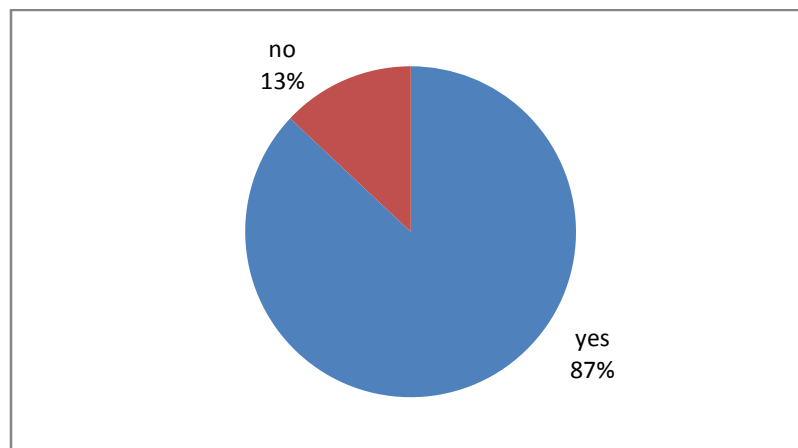


Figure 4.7 Use of ICT Facilities in School to Store Students' Data

Figure 4.7 shows whether ICT facilities in school were used to store students' data. 87% of schools used ICT facilities to store students' data while 13% of

school did not. In this study majority of teachers in charge of ICT agreed that they were using ICTs to store students' data. Matovu (2012) established that various departments were storing students' data electronically.

4.6.2 Types of Students' Data Stored Using ICT in School

Different types of data can be stored in computers. It was necessary for the study to establish the types of students data stored in computers. The data was collected and is presented in Figure 4.8

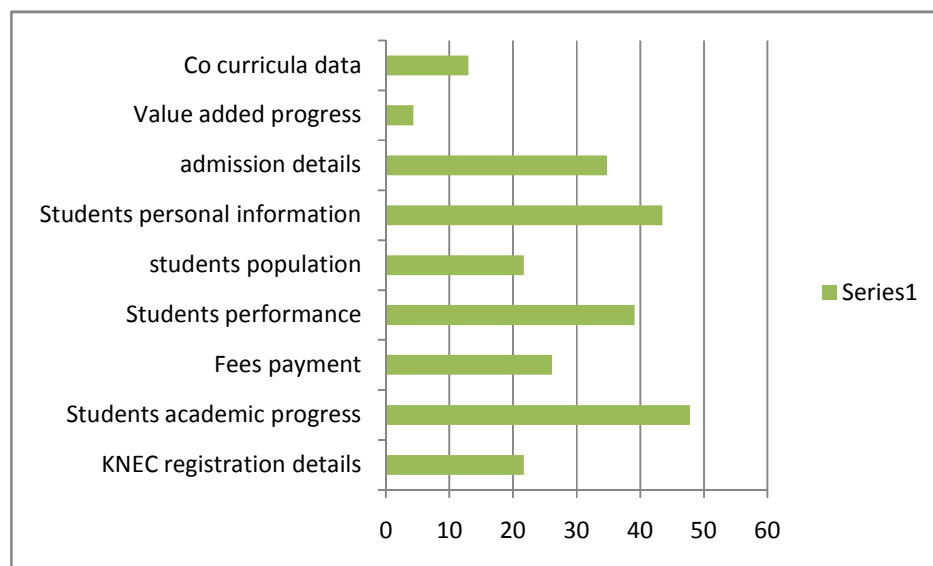


Figure 4.8 Types of Students' Data Stored Using ICT in School

Figure 4.8 shows types of students' data stored using ICT in school. The most common stored data was students' academic progress, at 47.8%, followed by students' personal information, at 43.5%, then by students' performance, at 39.1%, then by admission details, at 34.8%, then by records of fees payment, at 26.1%, then by KNEC registration details, at 21.7%, and students' population,

also at 21.7%, then by co-curricular data, at 13%, and value-added progress at 4.3%. The students' data which can be stored in ICT include students' personal information such as age, gender, next of kin and health matters. Ziraba (2012) identified the following data which were stored electronically; student's background information, data on gender and performance trends.

4.6.3 The Benefits of Storing Students' Data in Computers

ICT use for storing students' data may benefit the school in several ways. The study established the benefits of storing students' data in computers and the data is presented in Figure 4.9

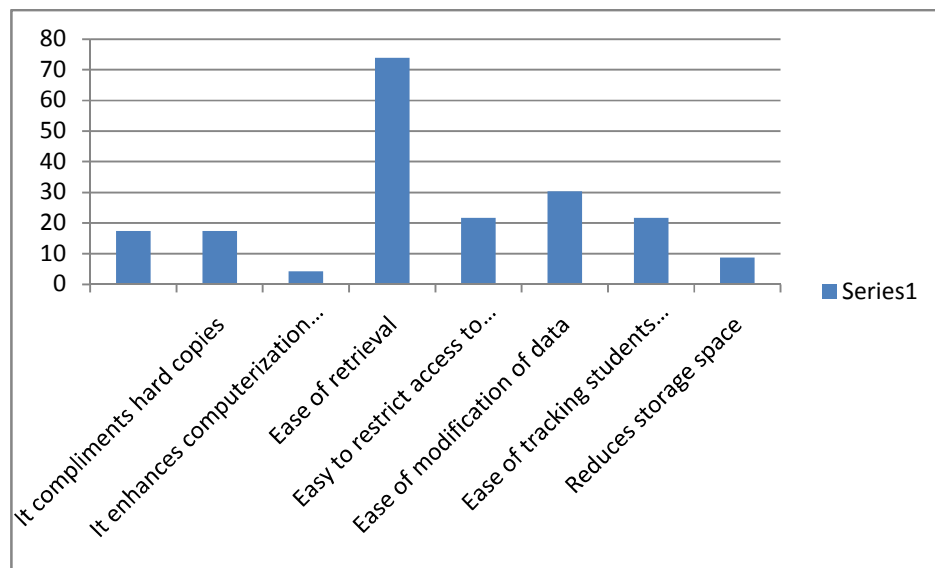


Figure 4.9 Benefits of Storing Students' Data in Computers

Figure 4.9 shows the benefits of storing students' data in computers. The most common benefit was ease of retrieval of information, at 73.9%, followed by ability to modify data, at 30.4%, then by ability to restrict access to unauthorized

persons, at 21.7%, ability to monitor students' progress, also at 21.7%, then by reduced bulkiness associated manual files, at 17.4%, ability to compliment manual files, also at 17.4%, then by reduced storage space, at 8.7%, then by enhanced computerization of departments, at 4.3%. Majority of teachers' in-charge of ICT agreed that use of ICT in storing students' data led to easy retrieval of the data. Devon (2004) as quoted by Matovu (2012) indicated reduced workloads and easy retrieval as some of the benefits accruing from storing data in computers.

4.6.4 Offices and Stakeholders with Whom Students' Stored Data is Shared

Students data stored can be shared to other offices outside the school. The study established the other offices which could use the students data stored in ICT. The data collected is presented in Figure 4.10

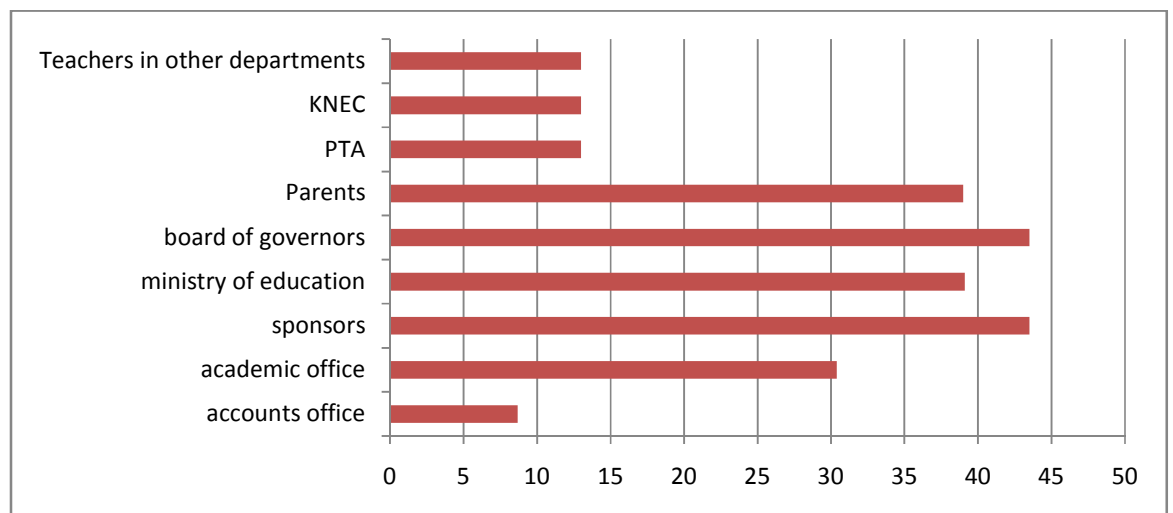


Figure 4.10 List the Offices and Stakeholders who Utilize the Students' Data in Computers

Figure 4.10 shows the offices and stakeholders that utilize students' data stored in computers. Sponsors and board of governors were the most common stakeholders with whom students' stored data was shared, at 43.5%, followed by the ministry of education, at 39.1%, then by parents at 39%, then by the academic office, at 30.4%, then by Parents Teachers Association (PTA), at 13%, teachers in other departments, at 13%, and KNEC, also at 13%, and the accounts office, at 8.7%. This study revealed that the student data stored in computers was of great benefits to other offices apart from their own respective schools.

4.6.5 Importance of Students' Stored Data to the School Management

The students data stored in computers could be of help to the school management in several ways. The study established the importance of students' data to the school management and presented the data in Table 4.7.

Table 4.7 Importance of Data Stored to the School Management

Importance of data stored to the school management	Percentage
Monitoring student progress and performance	22.4
Setting of targets	9.6
Monitoring enrolment rates	21.7
Easy to avail information to other stakeholders	40.3
Total	100%

Table 4.7 shows the importance of students' stored data to the school management. The easiness to avail information to other stakeholders was the most important factor associated with students' data, at 40.3%, followed by monitoring of enrolment rates, at 26.7%, then by monitoring of student progress and performance, at 22.4%, and then by setting of targets, at 9.6%. Matovu (2012) noted that ICT helped in maintaining records of student's progress and could assist teachers in identifying students' weakness and determine measures that could be taken to address such.

4.6.7 Response of Teachers, Parents and other Stakeholders in the Use of ICT in Storing Data

The use of ICT to store student's data has drawn varied reactions from teachers, parents, and other stakeholders. The study established the respond of teachers, parents and other stockholders on use of ICT in storing student's data. The data was presented in Figure 4.11

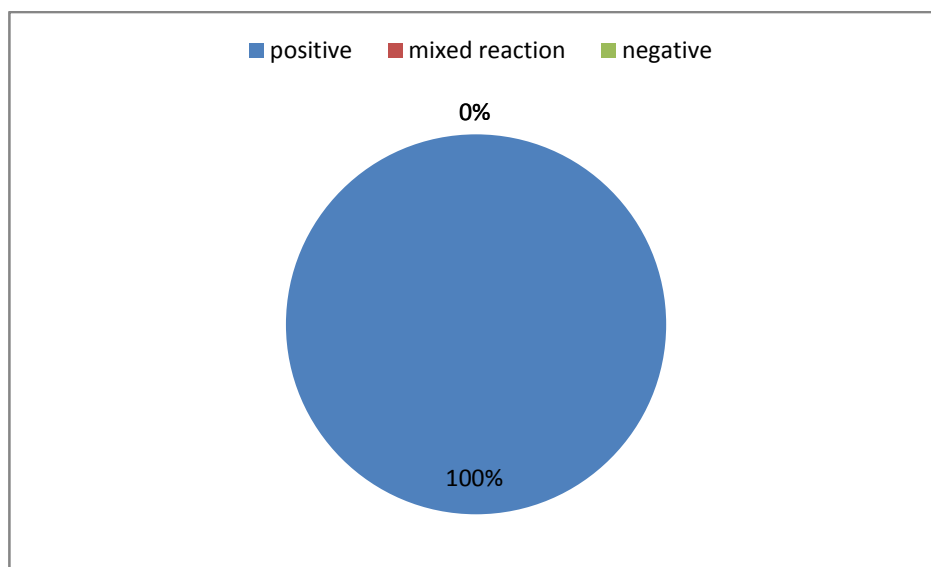


Figure 4.11 Response of Teachers, Parents and other Stakeholders in the Use of ICT in Storing Data

Figure 4.11 shows the response of teachers, parents and other stakeholders in the use of ICT in storing data. 100% of teachers, parents and other stakeholders agreed that the use of ICT in storing students data was of benefit to the school.

4.7 Use of ICT in Maintaining School Accounts in Management of Schools

The use ICT in management of school accounts was limited. Ziraba (2012) notes that several schools lacked enough skilled individuals who could use ICT in management of school finances. The study sought to find out the benefits of ICTs in financial management for the few schools that had incorporated this.

4.7.1 Benefits Derived From Using ICT in Managing School Accounts

Use of ICTs in managing school accounts is beneficial in various ways. This study established the benefits of ICTs in financial managements .The data is presented in Figure 4.12

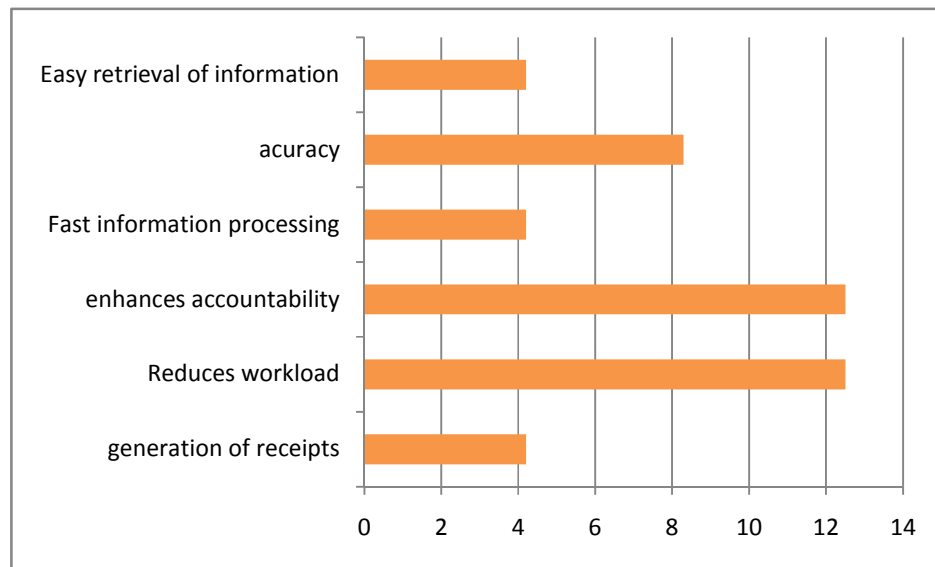


Figure 4.12 Benefits Derive from Using ICT in Managing School Accounts

Figure 4.12 shows the benefits derived from using ICT in managing school accounts. The most common benefit derived from using ICT in managing school accounts was enhanced accountability and reduced workload, both at 12.5%, followed by increased accuracy, at 8.3%, then by ability to generate receipts, at 4.2%, fast information processing, at 4.2%, easy retrieval of information, also at 4.2%. Majority of principals and teacher in-charge of ICT agreed that use of ICT in management of school accounts enhanced accountability and reduced the workload. Boit (2012) found out that the installation of financial systems handled to accurate and efficient financial book keeping.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the study, findings, conclusions, recommendations and suggestions for further research

5.2 Summary of the Study

The main purpose of the study was to investigate the utilization of ICT on management of public secondary schools in Trans Nzoia west district. The study focused on the following objectives; use of ICT on examination processing in management of public secondary schools, utilization of ICT on communication in management of public secondary schools, use of ICT in students' record keeping in management of public secondary schools and use of ICT in maintaining school accounts in management of public secondary schools in Trans Nzoia West District.

The study was guided by the Open Systems Theory. The main ideas were summarized in a conceptual framework that portrayed the link in the variables. The research design of this study was descriptive survey design. A purposive sampling technique was used targeting only schools with ICT facilities. Target population was 30 public secondary schools, 30 principals and 30 teachers in-

charge of ICT. The numbers were narrowed down to a sample size of 28 principals and 28 in-charge of ICT using the Krejcie and Morgan formula.

Validation of the research instruments was done through triangulation where the researcher used multiple methods in data collection. Two sets of questionnaires were used for school principals and the other for teachers' in-charge of ICT. The researcher conducted interviews with head teachers. An observation list was used to ascertain the availability of ICTs and the related infrastructure. The instrument reliability was computed using product moment correlation coefficient. The r value was 0.83 for teachers' in-charge of ICT and 0.82 for principals hence the instruments used were reliable. Data collected was analyzed using descriptive statistics

The study was to establish the use of ICT on management of examination in secondary schools. It was established that a good percentage of offices dealing with examinations had ICT facilities. That is Director of studies and secretaries offices. All schools used ICT in their schools for registration of KNEC examinations. The study revealed that 95% of schools used ICT in typing of internal examinations and analyzing the examinations. The study was to establish how ICT was used in communication within and without the school. Most schools (91.3%) used mobile phones especially the SMSs to communicate within the members of staff and to parents. Some of the benefits derived from using SMS to communicate to parents were, it was cheap, fast, reliable and reduced the chances

of distortion of messages. Use of internet in communication was mainly limited to the registration of KNEC examination as well as accessing results from KNEC.

The study revealed that most schools (87%) used ICT to store students' data. Some of the students' data which is stored in computers include value added progress, admission details, students' performance, fee payment and the KNEC registration details. Data on co- curricular was the least stored in many schools (13%). Most respondents stated these as some of the benefits of storing student's data in computers. There are; easy in retrieving information whenever it's required, it is easier to modify the data, it is easier to track student's performance and that ICT reduces the bulkiness associated with manual files.

The data stored in ICT was commonly shared with stakeholders who were mainly the sponsors, the board of governors, KNEC and the education officers. The study found out that the students data stored in computers was useful for school management because schools were able to monitor the student's progress, they were able to set up targets and the schools could easily monitor their enrolment rates. The study found out that the general response of parents and teachers on the use of ICT in storing student's data was positive. The study found out many schools had not incorporated use ICT in management of school accounts. Only 52% had computers at the accounts offices (Table 4.7)

Only 12 schools were utilizing ICT for budget preparation and management of school accounts. The benefits derived from used of ICT in management of school

accounts were that ICT enhanced accountability, reduced the accountant's workload and it was accurate. Many schools through the interviews expressed reservations in the use of ICT for financial management because of risks such as computer crashing with all information. This had made many schools to prefer the manual way of managing their accounts.

5.3 Conclusions of the Study

From the findings of the study several conclusions were arrived at based on the research questions; ICT has a big impact in the examination management in schools. All schools were using ICT in registering their candidates for national examinations. The internal examinations were utilizing ICT for examination typing as well analysis; ICT had enhanced communication between parents and schools. It is now easier to communicate to parents irrespective of the number and distance. Information cycle is complete because the school could get feedback immediately. This had been made easier with many people having mobile phones. The use of internet for was limited to registration of examinations; Schools in the rural set up were integrating use of ICT in their management systems despite the infrastructural challenges such as poor road network and lack of electricity.

Most schools were utilizing ICT mainly for examination registration, analysis of results. Typing of internal examination and storing student's records. Even with

computer facilities most schools were not utilizing computers for financial management, various schools had avoided using ICT for financial management.

5.4 Recommendations

Basing on the findings and conclusions already stated, the study recommended the following. The head teachers should sponsor more teachers especially the class teachers and those in charge of examinations for ICT training to increase ICT skills. The training could be pursued at the technical institutions which offer short training courses during school holidays. They should encourage teachers to utilize ICTs in preparation of professional documents such as schemes of work, records of work covered and exams records by demanding the same to be submitted in both softcopy and hardcopy.

KEMI should develop an ICT literacy training programme for all principals. This could be offered at the KEMI training centres which are distributed over the country during school holidays. KEMI should offer proper training for schools accountants in various courses dealing with financial management. This can be offered at the KEMI training centres across the country. Such courses should be made mandatory and schools to sponsor their workers

The Teachers Service Commission should make it a requirement that ICT literacy is a qualification for one to be a Head of department, a Deputy Principal and a Principal. This can be enforced during interviews and appointment for such offices. TSC should motivate ICT literate teachers through promotions, or special

allowances to encourage teachers to train in ICT. TSC being the employer of teachers, to compel institutions offering teacher education to have ICT training mandatory to all teachers.

The Ministry of Education should set standards for management of school, make ICT use mandatory to all public secondary schools. The directorate of quality assurance should ensure that all schools have incorporated ICTs in their management and administration. This can be enforced during the regular inspection of schools. They should work with other stakeholders to ensure that the ICT hardware and software are affordable to all public secondary schools for management.

5.5 Suggestion for Further Research

The following are suggested areas for further research

- i) Factors influencing the adoption and integration of ICT in Management of public secondary schools. This study could be an eye opener for schools which have failed to integrate ICT in their management
- ii) The impact of ICTs in management of public primary schools. This study could be of importance to the government though the Ministry of Education as they plan to introduce laptops to all primary schools
- iii) Institutional challenges faced in the implementation of ICT in school management and administration. This study could help school managers be

prepared for any eventualities as they integrate ICT in their management and administration.

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APPENDICES

APPENDIX I

INTRODUCTION LETTER

University of Nairobi,
Department of Educational,
Administration and Planning,
Box 30197 – 00100.
Nairobi.

The Principal

Dear Sir/ Madam

RE: PARTICIPATION IN RESEARCH

I am a Masters Student at the University of Nairobi undertaking a research titled:

Utilization of ICT in management of public secondary schools in Trans Nzoia

West District. I seek your permission to conduct a research in your institution.

The information provided by the respondents will be used only for this research and their identity will be handled with confidentiality.

Thank you.

Yours faithfully,

Elizabeth Makwara

APPENDIX II

INTERVIEW GUIDE FOR PRINCIPALS

- a)
 - i. Do you have computers in your school?
 - ii. Which offices have the computers?
- b)
 - i. How do you register your students for national examinations?
 - ii. How has ICT helped you in;
 - Recording of students marks
 - Ranking of students
 - Analysis of test results
- c)
 - i) Do you use ICT in communication?
 - ii) How has ICT enhanced communication in school and outside school?
- d)
 - i) Do you use ICT to store students data on enrolment, gender and next of kin/
 - ii) How is the data stored important to the school management?
 - iii) What is the response of teachers, students, parents and other stakeholders in your use of ICT in storing student's data?
- e)
 - i) Do you use computers in management of your school accounts?
 - ii) Which aspects of school accounts do you utilize ICT?
 - iii) What benefits do you derive from using ICTs in managing your school accounts?

Thank you.

APPENDIX III

QUESTIONNAIRE FOR PRINCIPALS

This questionnaire is intended to investigate the utilization of ICT in management of public secondary schools in Trans Nzoia West District. I kindly request you to fill the questionnaire and assure you that all information provided will be handled with confidentiality. Tick ($\sqrt{\quad}$) appropriately

Section A: Background Information

- i) What is your gender?
Male () Female ()
- ii) What is your age bracket?
Below 30 years () 40-50 years () above 50 years ()
- iii) What is your education level?
Diploma () Degree () Masters ()
- iv) How long have you been in Management?
Below 5years () 5-10 years () 15-20 years() above 20 years ()

Section B: Use of ICTs in Management of your school

- i) How long have you had computers in your school?
 - a) Less than a year ()
 - b) 2 – 4 years ()
 - c) 4 - 8 years ()
 - d) Above 8yrs ()

ii) What is the percentage of teachers who have access to the school computers?

- a) About 10%
- b) About 20%
- c) About 50%
- d) Above 75%

iii) For what purposes does your school use ICTs?

- a) Preparation of timetable ()
- b) Email communication ()
- c) Budget preparation ()
- d) Management of students records ()
- e) Analysis of examinations ()
- f) Typing of examinations ()
- g) Internal search ()
- h) Online registration of students ()
- i) Management of school accounts ()

iv) What is the impact of ICTS on management of examination?

i. _____

ii. _____

iii. _____

v) State the benefits of ICT use on communication.

i. _____

ii. _____

vi) What are the benefits of storing students' data in computers?

i. _____

ii. _____

vii) State the benefits of ICT use in financial management

i. _____

ii. _____

Thank you

APPENDIX IV

QUESTIONNAIRE FOR TEACHERS IN-CHARGE OF ICT

The questionnaire is intended to investigate the influence of ICT in Management of Secondary Schools in Trans Nzoia West District. I kindly request you to fill this questionnaire and assure you that the respondent's identity will be handled with confidentiality.

a) Background information

i) What is your gender?

Male () Female ()

ii) What is your age bracket?

Below 30 years () 40-50 years () above 50 years ()

iii) What is your education level?

Diploma () Degree () Masters ()

iv) How long have you been in Management?

Below 5 years () 5-10 years () 15-20 years () above 20 years ()

Section B: Use of ICT on examination processing in management of schools

i) Indicate the responses by ticking appropriately: SA-strongly agree, A-Agree, UN-Undecided, SDA- Strongly Disagree.

	SA	A	UN	DA	SDA
i) Availability of ICT facilities makes the KNEC registration convenient.					

ii) With ICT I save time dealing with examination exercise.					
iii) Student database enhances efficiency in tracking students academic progress.					
iv) With. ICT safely keep all student academic records					

ii) Rate the influence of computer software on the following aspects of Examination management .A) High impact, B) Moderate impact, C) Little Impact D) No Impact.

Examination management	A	B	C	D
i) KNEC registration.				
ii) Examination analysis.				
iii) Examination typing.				
iv) Storing student test scores.				

iii) What benefits do you derive from using your own ICTs in school in?

a) Examination registration.

b) Examination analysis

Section C Utilization of ICT in communication in management of schools

i) Indicate if the following are available in your school.

- a) Internet. (Yes) (No)
- b) Power point. (Yes) (No)
- c) Mobile phones (Yes) (No)

ii) Indicate your responses by ticking appropriately (often-O, sometimes-SOM, Rare-R).

How often do you use ICT for communication to the following?

	O	SOM	R
i) Communication to members of department.			
ii) Communication to parents.			
iii) Internet search.			

iii) What benefits do you get by using SMS to communicate to parents?

- i) _____
- ii. _____
- iii. _____

Section D: Use of ICT in student record keeping in management of schools

i) a) You use ICT facilities in school to store students data ?

(a) Yes (b) No

b) List the types of students' data stored by ICT in your school?

i. _____

ii. _____

iii. _____

c) What are the benefits of storing students' data in computers?

i. _____

ii. _____

iii. _____

d) i. Do you share the students' stored data with other offices and stakeholders?

(a) Yes (b) No

ii. List the offices and the stakeholders who utilize the students data in computers?

Thank you

APPENDIX IV
OBSERVATION LIST AND CHECKLIST

1. Identify the types of ICT and who uses them.

	Available	Not Available
Radio		
TV		
Laptops		
Desktop		
Projectors		
Internet		
Intranet		
Printers		
Photocopiers		

2. Identify the availability of related infrastructure. (Tick where available)

- Computer laboratory ()
- Computer rooms ()
- Electricity connection ()

3. Checking whether ICT available are operational

4. Software availability.(Tick where available)

- Word Processing ()
- Internet connectivity ()
- Data bases ()

APPENDIX V

LIST OF SCHOOLS WITH ICT FACILITIES

St Josephs Boys.	St Patricks KoyKoy.
St Josephs Girls.	Imaculate Girls Saboti.
St Monica girls.	Kabuyefwe Girls.
St Anthony Boys.	Boma secondary.
St Columbus secondary.	Bishop Crowley Secondary.
Kitale School.	St James Kapretwa
St. Brigids Girls.	Nakami Friends.
Masaba School.	St Hillario Secondary.
Matisi Secondary.	Kiungani Academy.
Saboti secondary.	Muongano Secondary.
St Marys Machewa.	Transzoia Secondary
Nabunga Secondary.	St Johns Sikinwa.
Kabuyefwe Boys.	Birunda secondary
St Therasas Sikhendu.	Mufutu Secondary
St Therasas Bikeke	

APPENDIX VII

**TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN
POPULATION**

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size


"S" is sample size.

APPENDIX VIII

RESEARCH AUTHORIZATION

APPENDIX VII: RESEARCH AUTHORIZATION

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550
Mobile: 0713 788 787 , 0735 404 245
Fax: 254-020-2213215
When replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: **NCST/RCD/14/013/1054** Date: **17th June 2013**

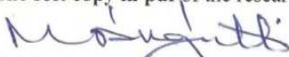
Elizabeth Makinia Makwara
University of Nairobi
P.O Box 92-0902
Kikuyu.

RE: RESEARCH AUTHORIZATION

Following your application dated **10th June, 2013** for authority to carry out research on *“The influence of information and communication technology on management of public secondary schools in Trans Nzoia West District, Kenya.”* I am pleased to inform you that you have been authorized to undertake research in **Trans Nzoia West District** for a period ending **31st December, 2013.**

You are advised to report to the **District Commissioner and District Education Officer, Trans Nzoia West District** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.



DR. M. K. RUGUTT, Bhd, HSC.
DEPUTY COUNCIL SECRETARY

Copy to:
The District Commissioner
The District Education Officer
Trans Nzoia West District.

“The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development”.

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APPENDIX IX
RESEARCH PERMIT

PAGE 2

PAGE 3

THIS IS TO CERTIFY THAT

Prof./Dr./Mr./Mrs./Miss/Institution

Elizabeth Makinia Matwara

of (Address) University of Nairobi

P. O. Box 92-0902, Kikuyu.

has been permitted to conduct research in

Location

Trans-Nzoia West

District

Rift Valley

Province

on the topic: The influence of information

and communication technology on

management of public secondary schools


in Trans-Nzoia West District, Kenya.

for a period ending: 31st December, 2013.

Research Permit No. NCST/RCD/14/013/1054

Date of issue 17th June, 2013

Fee received KSH. 1000



Applicant's Signature

For Secretary

National Council for Science & Technology