FACTORS INFLUENCING IMPLEMENTATION OF INFORMATION COMMUNICATION TECHNOLOGY IN PUBLIC SECONDARY SCHOOLS: A CASE OF TESO NORTH DISTRICT.

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DECLARATION

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

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DEDICATION

I would like to dedicate this project to my family in particular my wife Lilian Muyoka and my two lovely children Gift and Gloria for their support and caring environment which enabled me to complete my work smoothly. They made my work worthwhile. God bless them all.

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ABBREVIATIONS / ACRONYMS

ICT	–	Information Communication Technology
MOEST	–	Ministry of Education Science and Technology
SEC	-	Secondary
SCH	–	School
E.A.	–	East Africa
TND	–	Teso North District
DEO	–	District Education Officer
HT	–	Head teacher
ICTiEA	-	Information Communications Technology in Educational Administration
MRTTT	-	Ministry of Research, Technical Training and Technology

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ABSTRACT

The study examined the factors influencing the Implementation of Information Communication Technology (ICT) in public secondary schools in Teso North District. The study was focused on the level of adequacy of infrastructure, the level of principals' participation in the management and the constraints to effective usage of ICT in secondary schools. It is hoped that the study will be useful in that it will contribute valuable knowledge to the field of ICT integration in secondary schools in general. It's expected to produce hitherto unavailable knowledge on this subject. This study adopted the descriptive research design. This design involved the measurement, classification, analysis, comparison and interpretation of data. The study population comprised of 200 respondents. This includded 20 district schools four provincial schools and one National school. Purposive sampling procedure was used to select the national and provincial schools from the district. Systematic random sampling was used to select district schools. Questionnaires were prepared by the researcher and used as main instruments for the collection of data. This was used since they enhance a collection of more detailed data. The data was analyzed using descriptive statistical approaches whereby the sums, frequencies and percentages were calculated. The results of the analysis were presented in tabular form for easy and concise discussions and support on logical basis. The summary of findings, conclusions and recommendations were given for future action.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Information communication technologies (ICTs) are information handling tools that are used to produce, store, and process, distribute and exchange information. These different tools are now able to work together, and combine to form networked world which reaches into every corner of the globe (UNDP Evaluation Office, 2001). It is an increasingly powerful tool for participating in global markets, promoting political accountability; improving the delivery of basic services; and enhancing local development opportunities (UNDP, 2006).

Ogunsola (2005:3) ICT "is an electronic based system of information transmission, reception, processing and retrieval, which has drastically changed the way we think, the way we live and the environment in which we live". It can be used to access global knowledge and communication with other people (Ogunsola, 2005:3).

Students who use ICTs gain deeper understanding of complex topics and concepts and are more likely to recall information and use it to solve problem outside the classroom (Apple Computer, 2002). In addition, through ICT, students extend and deepen their knowledge, investigation, and inquiry according to their needs and interest when access to information is available on multiple levels (CEO Forum on Education and Technology, 2001:8).

It is difficult and maybe even impossible to imagine future learning environments that are not supported, in one way or another, by ICT. When looking at the current widespread diffusion and use of ICT in modern societies, especially by the young – the so-called digital generation – then it should be clear that ICT will affect the complete learning process today and in the future. Both the Member States and the European Union have dedicated effort and resources to the promotion and implementation of ICT in education and training; and they continue to

do so (e.g. the EU eLearning Programme). It has also been acknowledged by the European Council held in Lisbon on 23 and 24 March 2000 that there is an urgent need to adapt European education and training systems according to the requirements of a knowledge-based society. There is, in other words, a widespread belief that ICTs have an important role to play in changing and modernizing educational systems and ways of learning.

South Asia is yet to harness the potential of ICT in creating, constructing, managing and sharing information and knowledge. India is rated high on appreciation because it has gone beyond policies that merely recognize the strategic role of ICT for growth and development and is already institutionalizing concrete measures that support ICT initiatives (Amitabh 2009). Pelgrum and Law (2003) claim the issue of 'computers in education' started to become popular in educational policy-making in the early 1980s, when relatively cheap microcomputers became available for the consumer market. They (2003) also note that with regard to the early introduction of microcomputers in education in 1980s, there were high expectations that it would make education more effective and motivating. Hepp, Hinostroza, Laval and Rehbein (2004) claim in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICTs have been utilized in education ever since their inception, but they have not always been massively present. Although at that time computers have not been fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society boosted interest in ICTs (Pelgrum, W.J., Law, N., 2003). Kozma and Anderson (2002) write in their paper "ICT and Educational Reform in Developed and Developing Countries" that education is at the core of the knowledge economy and learning society and that correspondingly, the role of ICTs in schools is shifting dramatically. Kozma and Wagner (2003) contend that the promise of information and communications technologies to enhance the basic education is a tremendously challenging area of development work today, in both poor and wealthy nations (Wagner, D., Kozma, R., 2003)

In many African countries, however, a major impediment is the lack of qualified teachers. This problem is further exacerbated by growing poverty and lack of funding for their salaries, and the exponential rise in student population in the last two decades (National Universities Commission, 2005) – that ironically relates to the admirable Millennium development goals concerning free universal primary education. The crisis is worsening further as increasing numbers of teachers become afflicted by HIV/AIDS. Indeed it has been observed by many that meeting the desperate need for more qualified, competent teachers is the most persistent and daunting challenge facing the African education system in general, and the integration of ICT in particular (Afe, 2002; Olakulehin, 2007). There is also an assumption that there are wide gaps in the use of ICTs between rural and urban schools (Aduwa-Ogiegbaen & Iyamu, 2005).

The educational systems worldwide has been delineated into different levels mainly pre-primary, primary, Secondary and tertiary levels. The increasing development of educational systems at all levels brings greater demands on educational practitioners such as curriculum planners, evaluators and teachers in their bid to move along with the information technology of the 21st Century (Adeyemi 2010). As the world changes, information and knowledge change rapidly teaching and learning processes as well as the management of the schools also have to change. The use ICT has been tried to be integrated in schools with a hope of improving education quality, expand learning opportunities and make education accessible to all. The governments in many countries are now keen and committed on exploring the use of ICT for school education. Most government policies lately reflect their realization of the importance of integrating ICT use and the promotion of quality education enabled through ICTs. The creation of educational networks offers substantial economies of scale and scope, when attempting to improve the quality of education and seek to standardize quality across the system. Hence many Governments are investing in infrastructure facilities that link schools and other educational institutions and resource centers with the new technology (Amitabh 2009).

The earliest attempt at ICT policy formulation in Kenya dates back to the 1980s, but the process remained incomplete by 2000 (Nduati & Bowman, 2005). The formation of ICT policy in Kenyan education has its roots in the Ministry of Research of the time. The motivation was to develop national policy guidelines for the development of ICTs in the country in order to address the then prevailing haphazard growth of the sector. This was complemented by the readiness of donor agencies including UNESCO, in funding the current policy-making process. Reports by both Waema (2005) and Farrell (2007) seem to agree with the idea that fast and haphazard growth of information technology lacking direction and regulation provided an impetus for ICT policies as mentioned earlier. The second reason reported was a desire by the then Permanent Secretary (PS) in the then Ministry of Research, Technical Training and Technology (MRTTT) to develop national policy guidelines. This, as the Ministry expected, would steer the development of ICTs in the country in order to address the haphazard growth that was taking shape. The third factor was the readiness by the donor agency and in this case UNESCO to fund the policy making process.

The recent technologies such as the internet, email, and wireless communications are being integrated in the learning teaching institutions. This is largely due to the state of infrastructure development that has not allowed the adaptation of newer technologies as extensive as the older technologies. In recent times however, it has been noticed that the newer technologies are gaining prominence and are being integrated with the older technologies to make ICT applications in education more effective (Barasa 2010). The use of ICTs in Kenyan public secondary schools and African countries is generally increasing and dramatically growing (Tella & Adeyinka, 2007). However, despite administrators and experts alike recognizing the potential of ICT in improving access to quality education, the implementation and utilization is still low. Most schools are yet to harness the potential of ICTs in creating, constructing, capturing, managing and sharing information and knowledge.

The evolutions of the computer and it's capability to handle diverse kinds of problems has made easy the mounting challenges created by the staggering development in secondary school education. There is no doubt therefore, that secondary school education has become more complex and hence its management demands more from the managers. The enormous rise in the number of students in schools as well as the multiplicity of programmes have made school principals to handle large quantity of data which they must process speedily to provide information for the teachers service commission and ministry of education for effective management and decision making. Hence the use of ICT in the management process is imperative for sustainable development. It's however been observed that in many public secondary schools in the country, ICT tools like computer, internet and other telecommunication technologies that can aid teaching and learning are hardly in use or not available. It's against the background that the study examined challenges of implementing information and communication technology (ICT) in public secondary schools in Teso North District.

1.2Statement of the Problem

The enormous increase in student enrolment and teacher distribution in Teso North District schools has been noted by educationists. (Mohammed . 2006). This increase calls for the use of sophisticated equipment and facilities such as ICT for the processing of data in schools. However it has been observed that many public secondary schools hardly have ICT tools, the actual availability and utilizations are very low. ICT have become indispensable tools in today's information age, making a dramatic impact on the lives of people globally. This effect is most significant in education. The computer has become a motivating tool for teaching and learning in schools (Mossom 1986; World Bank 1999). The Internet allows cost-effective information delivery services, collaborative and distance education, more than has ever been imagined (Clyde 1995; Mbeki 1996; Todd 1997). At the inception of the millennium, Kenya's education authorities embarked on a number of projects to introduce

(ICTs) into the Kenyan education set up; especially at the basic and secondary school levels. For instance, in the middle of the 1990s, educational providers realized that Kenyan professionals could not compete on the global market for jobs, because they were limited in skill, especially in the area of Information Technology. Subsequently, the authorities incorporated the study of ICTs as part of the study of science. The government of Kenya in collaboration with Non-Governmental Organizations (NGO), philanthropists and Parent-Teacher Associations (PTAs) introduced the teaching of science and ICTs centres. However, initiators found that the various programs were disintegrated, unstructured and did not cover all the schools (Nyarko, 2007).Teso North District like other districts in kenya has not fully embraced ICT in schools.This is evidenced by only two schools in the entire District prepare students for computer studies at KCSE level.The District Education Officer Mr.Indiasi has persistently during Education days in the District encouraged the schools to implement ICTs.

During the Teso North District 2010 KCSE results analysis relased on 20th july 2011 and presided over by the permanent secretary ministry of Education,the stakeholders in the education sector outcried the low rate of ICT implementation in district.

The task of this study therefore is to examine the relationship that exists between the challenges influencing implementation of ICT and their integration in public secondary schools in Teso North District. n addressing this problem the researcher will formulate hypothesis.

1.3 Purpose of the Study

The purpose of the study was to examine the factors influencing the Implementation of Information Communication Technology ICT in public secondary schools in Teso North District.

1.4 objectives of the Study of the study

The following were the specific objectives guided the researcher during the study:-

i. To establish the extent to which the cost of ICT infrastructure influence its ICT implementation in public secondary schools in Teso North District.

ii. To investigate the extent to which adequacy of physical facilities influence its implementation in public secondary schools in Teso North District.

iii. To determine the extent to which lack of ICT awareness influence its implementation in public secondary schools in Teso North District.

iv. To find out the extend to which the principals attitude towards computers influence implementation of ICT in public secondary schools in Teso North District.

1.5 Research Hypothesis

Hypothesis is a tentative explanation that account for a set of factors and can be tested by further investigation. This study tested the following four hypotheses:-

i. **Ho**: There is no relationship between cost and ICT implementation.

ii. **Ho:** There is no relationship between adequacy of ICT infrastructure and ICT implementation.

iii. **Ho:** There is no relationship between ICT awareness and ICT implementation.

iv. **Ho**: There is no relationship between Principles attitudes and ICT implementation

1.6 Significance of the Study

It is hoped that the study will be useful in that it will contribute valuable knowledge to the field of ICT integration in secondary schools in general. It's the only study that has focused on ICT integration / implementation in public secondary schools in Teso North District. As such it's expected to produce hitherto unavailable knowledge on this subject. It is also hoped that study findings will form a useful material for reference to other researchers and other readers in general. The study is also expected to suggest significant policy statement through its recommendations.

1.7 Delimitation of the study

This study on factors influencing implementation of ICT in public secondary schools was conducted in Teso North District between March and July 2012. Most of the schools are accessible due to the available means of transport and communication. The researcher is familiar with the area of study since he works from there. Teso North has many public secondary schools which accommodates principals and teachers from all parts of the country whose feedback could represent a national outlook of Kenyan citizen.

1.8 Limitations of the Study

Unwillingness by some respondents to fill the questionnaires, the researcher explained to the respondents about their ethical considerations and the purpose of the study.

There may be inadequate financial resources for exhaustive collection of data in the entire district so the collected data might not be reliable enough for the study, however the researcher strictly followed the budget so as to capture all that is needed by the study.

Lack of adequate time to complete the study promptly due to other commitments however this was overcome by the researcher strictly following the time frame, proper planning and

appropriate sampling which will be representative of the entire population. The researcher will also be devoted and use extra time to accomplish the research project on time.

1.9 Assumptions of the Study

All the questionnaires were fully filled by the study respondents as per the study questions without any biasness. The researcher had adequate financial resources to complete the study on time as per the budget and adequate time to complete the study on time as per the study action plan. The data collection instruments collected accurate information that is representative of the study of factors influencing implementation of ICT in public secondary schools in Teso North District in Kenya.

1.10 Definition of Significant Terms

School – Public teaching and learning institution with a population of above 15 students

Implementation – Adopt or execute or take action has officially planned

Information Communication Technology – Computer knowledge of use and application

Challenges – Setbacks, constraints or hindrances

Cost – price or charge on acquiring a computer and other accessories

Adequacy – sufficient or enough physical and technical services computers

Attitude – feelings or thoughts towards computers

Public secondary schools - State funded educational institution

Awareness - knowledge or understanding of Inte computer use and application

District – borough or sub-county in a country

ICT infrastructure -requirements for ICT e.g. electricity, rooms

Integration -to Inco-operate or include in the process.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature on ICT implementation in public secondary schools. The main review encompasses the background factors that influence the implementation of ICT in public secondary schools, especially cost of ICT infrastructure on the implementation of ICT in public secondary schools, adequacy of physical facilities in relation to implementation of ICT in public secondary schools, extend to which lack of ICT awareness affect ICT implementation in public secondary schools, extend to which the principals attitude towards computers affect implementation of ICT in public secondary schools, theoretical frame work, conceptual frame work and gaps in literature review.ICT (particularly computers and the Internet) are widely acknowledged as important resources for socio-economic advancement in both developed and developing countries. This is doubly so against the backdrop of the global economy which is driven by the "information age". Developing countries, however, face enormous challenges in their ability to utilize these resources for their growth and development agenda. Limitations range from infrastructural constraints to an individual's ability to convert access to ICTs into tangible benefits in light of other environmental constraints.Literature shows that there is limited use of ICT in schools. According to Bingimlas (2009: 237), "the act of integrating ICT into teaching and learning is a complex process and one that may encounter a number of difficulties known as barriers. The barriers could be viewed as deprivation of the educators' capabilities. The objective being analyzed in this study is limited access and use of ICT by educators in schools. The perspective of limited access or use of ICT as deprivation of capabilities provides a conceptual basis for this paper. Taking this approach, we can explore the use/access of ICT by educators in Teso North District. This chapter will consist of readings that support the study and trying to identify some gaps that the study will address. This will be

discussed in line with the objectives of the study, theoretical frame work, the conceptual frame work and conclusion.

2.2 Costs of ICT infrastructure and the implementation of ICT in public secondary schools in Teso North District

The Capability Approach has been developed, refined and defended over a period of time by Sen in different articles (Sen, 1984; 1985; 1987; 1992; 1993; 1999; 2000). The approach is directly concerned with what people are effectively able to do and to be, taking into account the resources which they have access to. In other words, the approach focuses on individuals' capabilities and freedom. Sen (1999) defines the term 'freedom' as effective opportunities individuals have to live the sort of lifestyle they have reasons to value. According to Sen (1993), in social evaluations and policy designs the concern should be on individuals' capabilities, on the quality of their lives and on freeing their lives from obstacles.

The Capability Approach to a person's advantage is concerned with evaluating it in terms of his or her actual ability to achieve various valuable functioning's as a part of living. The corresponding approach to social advantage – for aggregative appraisal as well as for the choice of institutions and policy – takes the set of individual capabilities as constituting indispensable and central part of the relevant informational base of such evaluations (Sen, 1993: 30).

Given the current budgetary and resource constraints of various Governments, a widespread investment in ICTs in education is probably not possible in most developing countries. It is therefore entirely important to better understand the cost-benefits equation of the wide range of ICT options and uses in order to effectively target spend the scarce resources. Economies of scale are achievable in distance education, although such programmes typically require large up-front investments. Some of these costs may be shifted from the public sector to the individual users, but this in itself raises significant equity and access issues (Adeyemic 2009)

Government's the world over are increasingly articulating the spending of large sums of money on ICT Programmes and schemes. Despite of all these many countries are not fully literate, it is time that innovative and cost effective ICT infrastructure is put in place to address the problem of educational implementation of ICT reforms in these countries. (Victoria 2003). New technology in whatever form, can be a major drain on an organizations financial resources. Installing new infrastructure on the production line will involve a heavy capital outlay and deception to production while the work is completed. The cost of research and development can be huge and many learning institutions may not able to access the most modern infrastructure for their schools (Saleems 2008).

New ICT infrastructures do not always work effectively from the start, some teething problem are almost inevitable. Workers will take time to adapt to what is required of them and the technology may not work effectively. While this is a problem and points to the need for reform in educational systems, pedagogical, curricular, as well as institutional innovative and the emergence of various information and communications technologies and their increasing acceptance and adoption by society provide unique opportunities and could potentially promote educational on a large scale (Victoria 2003).

In most of schools in the sub-countries the teachers are overloaded, less motivated and inadequately trained, and often deal with inconvenient working conditions. In such atmosphere, the cost of building capacity of teachers so that they are equipped to deal with using ICTs in classrooms is a challenge (International institute for communication and development 2004).

2.3 Availability of physical facilities in relation to implementation of ICT in Public Secondary Schools

Access to adequate technology is clearly a prerequisite for successful adoption. One school in Mexico reported very high levels of integration of graphing calculators, but much lower levels of integration of ICT generally, mainly because of lack of access to the computer room (MX02, p7). With limited resources, some schools have given first priority in access to computers to their ICT skills courses, often leaving other teachers with little or no access (NL03, Jacobus). It was noted in a Luxembourg school that ICT could be used in any subjects if the computer labs were free, but that in reality they were very rarely unoccupied (LU02,) A Finnish school (FI03) identified as a key factor in the use of ICT was that there should be sufficient computer rooms to ensure that subject teachers were easily able to get access when they wanted it.

A country's education technology infrastructure sits on top of the national telecommunications and information technology infrastructure. Availability of adequate infrastructure to support the development of ICTs in schools is a tremendous challenge that schools in the region currently face. Apart from the high initial costs, as well as the best and effort of supporting such infrastructure, the maintenance and upgrade costs, as wee as the process of setting up the requisite infrastructure are also roadblocks to the successful usage of ICTs in schools, especially in poor and remote areas (Patti 2008).

Before any ICT – base programme is launched; policy makers and planners must carefully consider in the first place, a basic requirement whether appropriate rooms or buildings available to house the technology. In countries whose there are many old school buildings, extensive retrofitting to ensure proper electrical wiring, heating /cooling and ventilation and safety and security are enhanced. The availability of electricity and telephone should also be considered (Saleemi 2009). In most areas of the country are liable supply of electricity and the nearness to telephone are still miles away. Policy makers should also look at the ubiquity

of different types of ICT in the country in general, and in the education systems at all levels in particular for instance, a basic requirement for computer based or online learning access to computer in schools communities and households, as well as affordable internet service.

2.4 Extend of ICT awareness influence ICT implementation in public secondary schools.

ICT use was further limited by problems with technical support. In most schools, technical difficulties were reported as a major barrier to usage and a source of frustration for students and teachers. A technical school in Luxembourg stated that "technical problems remain a serious deterrent" to ICT use. "The technical problems that arose were much more difficult to solve than... envisaged. Also the school lacked permanent technical staff to solve these general maintenance and technical problems, so that computer teachers found themselves overwhelmed with this responsibility as well as teaching". (LU02, Biever 2008). A Canadian student said "Our system is down maybe once a month. When the system goes down, the school pretty much shuts down" (CA01, p5). Technical difficulties were also a deterrent to teacher use, confirmed by a Canadian teacher, "I think resistance to technology has occurred because of frustration of the effectiveness of the machines... half the computers don' t work, or the printers' don' t work. After that occurs numerous times, people stop using them. They can only tolerate so much of that". (CA04, p5) In developing countries, ICTs are used largely to increase access to and improve the relevance and quality of education. ICTs have demonstrated potential to increase the options, access, participation and achievement for all students (Haddad, 2003) with knowledge as the crucial input for productive processes within today's economy, the efficiency by which knowledge is acquired and applied determines economies success. Effective use of ICTs can only contribute to the timely transmission of information and knowledge when the personnel involved are aware of its availability.

There is a general lack of awareness about the utility of ICTs in education, as well as about the ICTs at our disposal and how they can be accessed and utilized economically and effectively. This lack of awareness and knowledge about ICTs and their use in education, even on the part of policy makers, administrators and educators, make particularly difficult to

deploy ICTs in the field of school education. (Patti 2008). Another critical issue with the usage of ICT in schools is the implementation of new technologies without having analyzed their appropriateness applicability and impact on various environments and contexts. In most countries, particularly the least developed ones, they must learn from the experiences of others, but must also use technology to respondent to their own needs and not just follow trends (Piatti 2008).

2.5 Extend to which the principals attitude towards computers affect implementation of ICT in public secondary schools in Teso North District.

A number of studies (e.g. Cox *et al*, 1999; Mumtaz 2000; Grainger & Tolhurst, 2005) have shown that there are a wide range of factors which influence educators' under-utilization of ICT in their teaching.

These include access to resources, quality of software and hardware, ease of use, incentives to change, support and collegiality in their school, school policies, commitment to professional learning and background in formal ICT training (Cox *et al*, 1999; Mumtaz, 2000; Becta 2003). In addition, computer-phobia is argued to be a major deterrent to the utilization of ICT by educators. It is believed that capabilities and constraints determine the efficacy (real and perceived) of an individual's taking particular actions (Stern, Dietz, Abel, Guagnano & Kalof, 1999). For many teachers who may have the capability to use ICT, lack of self-confidence in using the technology is noted to be a strong limiting

A very different use of ICT is for educational management. An example was found at High Grove School in the UK (UK02), in which the innovation was the development of a comprehensive school database. The aim was the allow staff to review student performance easily, thus ensuring that under-achievers could be easily identified. As part of the innovation, students were encouraged to monitor their own progress against personal targets, set in consultation with the teachers. The students interviewed felt that they were helped by

having clear information about their performance, and the school reported students taking more responsibility for their own learning.

According to [Rogers, E.M. (2003)]. people's attitudes toward a new technology are a key element in its diffusion. Han, C. (2002), conducted a case study on pre-school principals' practices in the use of ICT and reported that principals' attitudes toward technology are a variable that determines the extent to which computers are used in school. Besides, he added that principals who have positive attitudes toward technology are very helpful and supportive in introducing these new technologies into the school. For example, they encourage their colleagues to have ICT training, equip the school with sufficient computers and ensure the staff has access to relevant technology. Hence, if principals understand the value of ICT and its benefits, they are able to implement innovations in school. Furthermore, Zimbardo, P., Ebbesen, E., & Maslach, C. (1977) Stated that changing individuals' behavior is possible once their attitudes have been identified. Azjen, I., & Fishbein, M. (2005); that Attitude is made up of three components: affect, cognition, and behavior. The affective element refers to the individual's emotional feelings or liking of a person or an object. The cognitive element refers to the person's knowledge about a person or an object. The behavioral element refers to the person's overt behavior towards a person or an object. That "even though we cannot predict the behavior of single individuals, we should be able to predict that people (in general) will change their behavior if we can change their attitudes..." Therefore, attitudes of participants revolved in an educational innovation are important factors in determining to what degree and with what speed change will be affected Fullan, M. (2002).

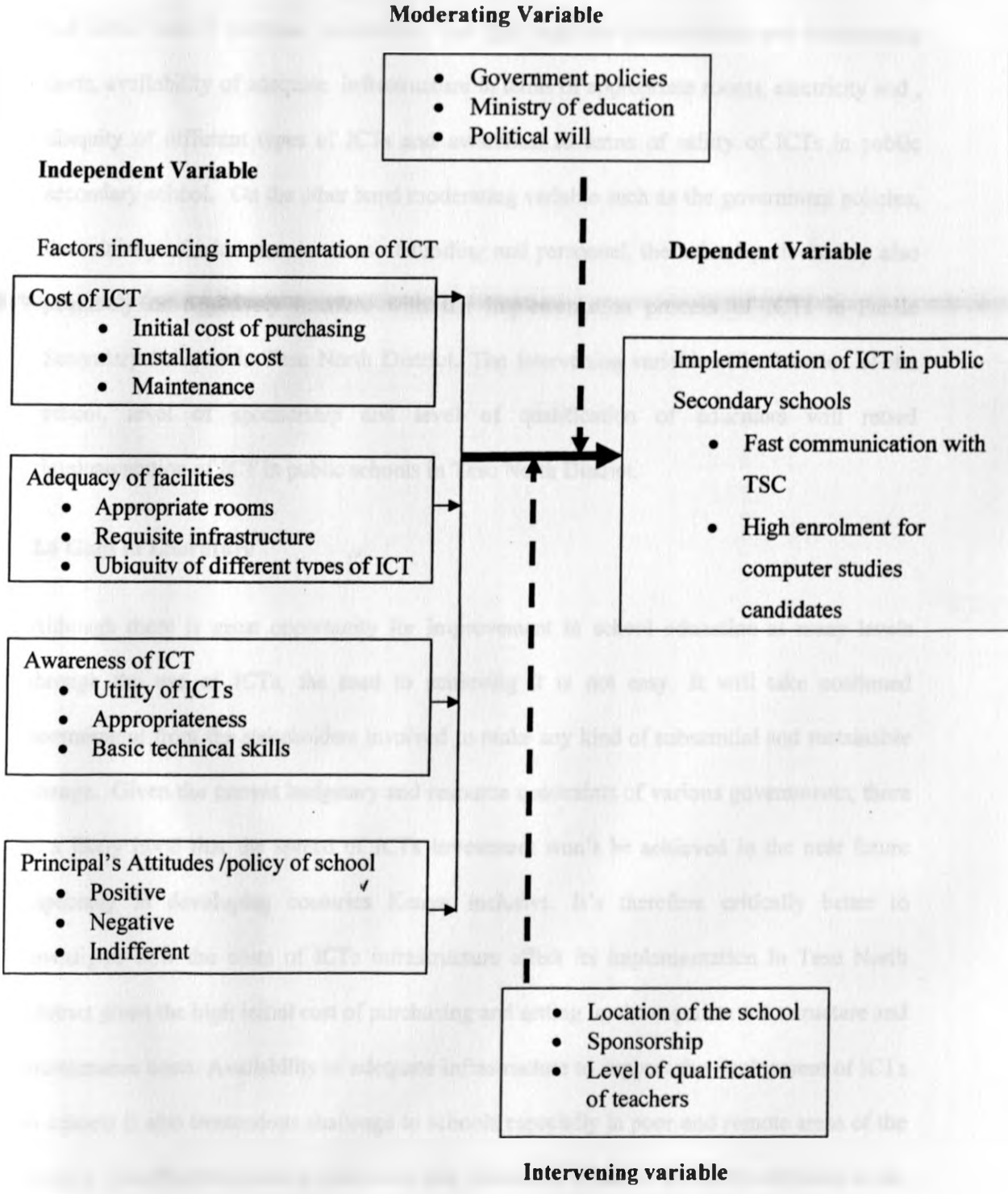
2.6 Theoretical Frame Work

The theoretical framework for this study was based upon the open systems theory as espoused by Kast and Rosenzweig (1985). The incorporation of ICT into the day-to-day functions of educational institutions has a marked impact on every aspect of management structure and dynamics. It means the study on ICT introduction in the schools would not have been exhaustive if the social and technical aspects are not considered in their entirety explaining the reason for the adoption of the socio-technical approach in the study based on the open systems theory.

In open systems theory, the school being a typical example of an organization is viewed as an open socio-technical system composed of five (5) major, partly overlapping and interdependent sub-systems namely: managerial, structural, psychosocial, goals and values, and technical. The school's five sub-systems interact with the external environment in such a manner that bringing change in one would necessarily lead to changes in all the others. Therefore, when considering the introduction of innovations in schools, it is prudent to take cognizance of the interdependencies and interactions first between the five sub-systems and secondly with the external environment. The five sub-systems and the interactions among them provide a five-component socio-technical framework for the study of information communications technology in educational administration (ICTiEA) knowledge base. As stated earlier, this was chosen to guide this study due to its all encompassing nature to get the total picture of the factors that influence ICT implementation in schools, as this avoids an overemphasis of some elements over others.

2.7 Conceptual Frame Work.

This framework gives the relationship between the independent and the dependent variables in broader scope. It helps to conceptualize the problem and provide means to link ideas with data so that deeper connection can be revealed.Extranous and intervening variables are also brought in picture for greater understanding of the actual influence.



Interpretation

Its hypothesized that the independent variable namely, the cost of infrastructure in terms of the initial cost of purchase, installation, the right requisite infrastructure and maintenance costs, availability of adequate infrastructure in terms of appropriate rooms, electricity and , ubiquity of different types of ICTs and awareness to terms of utility of ICTs in public secondary school. On the other hand moderating variable such as the government policies, the ministry of education in terms of funding and personnel, the school policies may also positively or negatively interfere with the implementation process of ICTs in Public Secondary Schools in Teso North District. The intervening variables like location of the school, level of sponsorship and level of qualification of educators will retard implementation of ICT in public schools in Teso North District.

2.6 Gaps in Literature

Although there is great opportunity for improvement in school education at many levels through the use of ICTs, the road to achieving it is not easy. It will take continued commitment from the stakeholders involved to make any kind of substantial and sustainable change. Given the current budgetary and resource constraints of various governments, there is a likely hood that the spread of ICTs investment won't be achieved in the near future especially in developing countries Kenya inclusive. It's therefore critically better to investigate now the costs of ICTs infrastructure affect its implementation in Teso North District given the high initial cost of purchasing and setting up the requisite infrastructure and maintenance costs. Availability of adequate infrastructure to support the deployment of ICTs in schools is also tremendous challenge to schools especially in poor and remote areas of the country. Insufficient access to computers and awareness is one of the main obstacles to the

spread of ICT usage in school education. This is more so in the case of rural areas where the schools are often without integrated new technologies but rather using old technology in schools. The researcher hopes to unravel away possible of integrating ICTs applications in secondary schools in Teso North District, with a hope that the education stakeholder integrate new technologies with existing technologies in use, new technology should gain prominence and used alongside the old technologies of print, radio and television.

The government support and cooperation will also be necessary for ICTs programmes to have substantial impact and be sustainable. The government should attempt to reevaluate the education delivery system and curriculum of the country to include ICT. The state should also create community-Based ICT facilities that may facilitate an expanded accessibility to ICT based materials. Lastly the study intends to determine the factors affecting implementation of ICTs in public Secondary School in Teso North District.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covered the following topics; research design, the study area, the study population, sample size, sampling procedure, research instruments, reliability, validity, procedure for data collection and data analysis.

3.2 Research Design

This study adopted the descriptive research design of the survey type. According to Kerlinger (1973), a descriptive study is not restricted to fact findings, but may often result in the formulation of important principles of knowledge and solutions to significant problems. This design describes and interprets what is. It is concerned with conditions or relationships that exists, opinions that are held, process that are going on, effects that are evident or trends that are developing Best &Khan(2009) This design will involve the measurement, classification, analysis, comparison and interpretation of data. It will investigate possible cause and effect relationship by observing existing, condition or state of affairs and searching back in time for possible caused factors affecting the implementation of ICTs in Teso North District.

3.3 The Study Area

Teso North District is one of the five constituencies' in Busia County. The constituency boarders Bumula to the west, Sirisia to the North East and Busia to the East. The constituency covers an area of 302km^2 and stands on an altitude of 1215m above sea level. The annual rainfall in the District varies from 1250mm to 1800mm. most of the rainfall occurs during the long rains and is usually heaviest in April and May. The main crops grown in the area are

maize, beans, millet, sorghum, sweet potatoes, tobacco etc. The District has 18 secondary schools with a total student's population of 4,131.

Despite the pleasant natural conditions, the District has a high prevalence of poverty. The main causes of poverty among others are poor infrastructure the collapse of agricultural marketing institutions, high cost of farm inputs and lack of access to production factors. In view of the foregoing circumstances education is considered to play significant role in enhancing social mobility in the District.

3.4 The Target Population

The study population comprised of 25 schools in Teso North District, according to the latest records with the DEO Teso north district accessed on 5th July 2012. Each school has one principal and seven departments headed by heads of departments (HOD's) viz, Humanities, Languages, Technicals, sciences, maths, G&C and co-curricular departments. These total to 175 HOD's from the schools under study. The schools under study have 25 principals, one from each school, the principals and HODs total to 200 potential respondents.

3.5 Sample and Sampling procedures

Purposive sampling procedure was used to select the principal from the national school category. This is because there is only one national school, in the district. Systematic random sampling was used to select district and provincial schools.In order to enhance representativeness,every respondeet came from a different school. The specific departments to respond to the questionnaire were chosen randomly. This involved selecting subjects from a population list in a systematic order.

. According to Mugenda and Mugenda (1999) 10% of the target population can be representative enough to generalize to the entire population

175 HODs gives

10/100x175=18 HODs to be chosen randomly from different schools

and 10% of the principals will be

10/100x25=3 principals. These principals were chosen purposely to accommodate one National school, one Provincial school and one District school. This gives a total of 21 respondents

3.6 Research Instruments

Questionnaires were prepared by the researcher and used as main instruments for the collection of data. Both closed and open ended questions were used. This is because they enhance a collection of more detailed information.

3.6.1 Reliability of the instruments

Lebman et .al (1985) defines reliability as the degree consistency between the measures of the same thing. According to (Brown 1999), it is a measure of the degree to which a research yields consisted results or data after repeated trials. The questionnaire was pretested to a selected sample of HOD's before administrating to the actual target population so as to determine its reliability. The test items used were correlated using the pearsons correlation coefficient and they gave a strong positive correlations of 0.9.

3.6.2 Validity of instruments.

Dane (1990) defines validity as the extent to which a measure actually measures what it's supposed to measure to ascertain the content of the research instruments. Mugenda and

Mugenda 1999) says that it refers to the degree to which results obtained from the analysis of the data actually represent the phenomena and under study. The instruments were piloted in neighbouring Bungoma South District. The researcher also consulted experts in the area from the faculty of education and lecturers in the department of planning and management at the University of Nairobi to ensure that they are accurate to obtain the intended data.

3.7 Procedure for Data Collection

The researcher sort permission from the school of graduate studies and a letter of introduction to do research from university of Nairobi. The researcher applied for permit from the office of the president through the DEO to carry out the study in the area and wrote letter for permission to issue questionnaire to the relevant personalities in the study areas.

3.8 Data Analysis

Multiple copies of transcripts were made to facilitate the analysis process the data was analyzed using the thematic approach, the researcher read the transcripts many times to familiarize himself with the data and to refine the finding for the translation.

The researcher then sought and coded the information systematically according to themes mentioned in the literature review using different colored pens. This helped to speed up his work later when marching the coded data with the themes. The findings w presented using frequency tables and results discussed.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, DISCUSSION ANDINTERPRETATION

4.1 Introduction

The chapter analyses presents and interprets data guided by the objectives of the study in the study schools on factors influencing implementation of information communication technology in Public Secondary Schools in Teso North District, Kenya. The chapter discusses the study findings based on the following objectives.

- To establish the extent to which the cost of ICT infrastructure influence its implementation in public secondary schools in Teso North District.
- To investigate the extent to which adequacy of physical facilities influence its implementation in public secondary school in Teso North District.
- To determine the extend to which lack of ICT awareness influence its implementation in public schools in Teso North District
- To find out the extent to which the principles attitude towards computer influence implementation of ICT in public secondary schools in Teso North District.

4.2 Response rate.

The sample of this study comprised of 21 participants, 3 principals and 18 heads of departments of various public secondary schools, drawn from the selected national provincial and district schools from Teso north district, Kenya. Therefore the demographic description of participants was based on the principals and the heads of departments. The response as 100%.

The demographic description of respondents s presented in Table 4.1.

Table 4.1 Qualification of the respondents.

Qualification	Languages	Sciences	Humanities	General	Total
Diplomas	1	1	0	1	3
Degree (BED)	4	4	4	2	14
Degree With PhD	0	0	0	1	1
Master of Education	0	0	0	1	1
General Degree	0	1	0	1	2
Total	**5**	**6**	**4**	**6**	**21**

From the Table 4.1, it can be deduced that most teachers have acquired higher education. The implication of this finding is that, the different factors influencing the implementation of ICTs cannot be attributed to the level of education of the teachers. 67% of the respondents cited that most teachers in the study schools had a bachelor degree in education with 5% indicating a master's degree. The teachers therefore are in a position to implement ICT when other factors are held constant

4.3 Costs of ICTs infrastructure on implementation of ICTs in public schools.

On investigation to determine the cots implication of ICTs infrastructure on implementation of ICTs in public schools, the researcher posed questions which attracted the following responses from the sample population from the study area.

4.3.1 Current cost of ICT equipments.

Investigation to determine the influence of the current costs of ICT equipments on its implementation in public secondary schools in Teso North District. The questionnaire enlisted the following responses, 80 %(17) of the respondents indicated that the current cost

of ICT equipments was expensive , compared with 20%(4) who cited they were not aware whether the current costs of ICT equipments influence it's implementation in the study schools. The table below shows the study findings.

Table 4.2 current costs of ICTs equipments on ICTs implementation in public schools.

Current cost	f	% response
Not expensive	0	0
Expensive	17	80
Not aware	4	20
Very expensive	0	0
Unachievable	0	0
Total	**21**	**100**

From table 4.2 it can be deduced that the current costs of ICTs equipments influence its implementation by 80%(17) of the respondents, this view can be supported by Adefemue (2009) which asserted that the current budgetary and resource constraints of various government has widespread hindrance on the investment of ICTs in education in most developing countries. Victoria(2003) also agrees that insufficiency of funds is the main cause of low rate of integrating ICT in production activities. Most schools could be willing to implement ICT programmes but due to the cost involved in procurement they fail to take-off.

4.3.2 Implementation process of ICTs in the schools.

Investigation to determine whether the implementation process of ICTs in the schools under study is satisfactory. The researcher posed the question that enlisted the following responses. 70 % (15) respondents indicated that the implementation process was unsatisfactory in the study schools, however 20%(4) cited that it was poor with 9%(2) respondents indicating that the process was good. The table below shows the study findings.

Table 4.1 implementation process of ICTs in schools

Implementation process	f	%response
Good	2	10
Poor	4	20
Unsatisfactory	15	70
Total	**21**	**100**

From the table 4.1 it can be revealed that the implementation process of ICTs in the study schools is unsatisfactory with 70% responses, this study findings is supported by Victoria 2003 when she asserted that despite many countries increasingly articulates spending large sums of money on ICT programmes and schemes in schools, the implementation process is slow in the countries. Though ICT is not a very old concept in Kenya. but looking at key ICT initiatives in education in Kenya, there is reason to argue that the process is far below average in implementation.

4.3.3 Level of ICT sponsorship in the schools.

On the level of ICT sponsorship in the study schools, the researcher posed a question and it enlisted the following responses: 87 %(18) respondents cited that the level of sponsorship was barely adequate however 13%(3) indicating that it was adequate. The table below shows the study findings.

Table 4.2 Level of ICT sponsorship in the schools.

Level of ICT sponsorship	f	% response
Adequate	3	13
Barely adequate	18	87
Total	**21**	**100**

From Table 4.2 it can be deduced that the level of sponsorship of ICTs implementation in the study schools was barely adequate by 87%(18) responses compared with 13% who cited that the level of sponsorship was adequate, the study findings are supported by Saleemi (2008) who asserted that many schools are not catered for when the government sponsor ICTs integration in public secondary schools. In 2007 only 142 computers were distributed to schools through the Kenya ICT Trust Fund. This selective sponsorship is not only biased but also inadequate.

4.3.4 **Extra cost of ICTs in public schools.**

Investigation on the influence of other costs of ICTs, their installation cost and maintenance cost enlisted the following response. 50% (10) indicated that initial cost is higher while 30%(6) indicating that the installation cost is also higher while 20%(4) indicating that the maintenance costs were high. The table below shows the study findings.

Table 4.3 Extra cost of ICTs in public schools.

Costs	f	% Responses
Initial Cost	10	50
Installation Costs	6	30
Maintenance Cost	5	20
Total	**21**	**100**

From table 4.3 it can be deduced that the initial costs of purchasing ICTs in public schools was high with 50% responses compared with 30% installation costs and 20% maintenance costs, this findings are supported by the views of Sen. (1984, 1985, 1987, 1992, 1993, 1999, 2000) through his capability approach that is concerned with evaluating investing in ICTs entirely by understanding the cost-benefits equation of the wide range of ICT options that are expensive to purchase and install. Victoria (2003) also posits that ICT investment is a drain of resources and organizations with meager resources may not afford.

4.4 Extent of physical facilities adequacy on ICT implementation in public secondary schools.

Access to adequate physical facilities is clearly a pre-requisite for successful implementation of ICTs in schools. Investigation on the availability of physical facilities in relation to implementation of ICT in public schools enlisted the following responses.

4.4.1 Adequacy of appropriate ICT rooms in the schools.

Investigation to determine the adequacy of appropriate ICT room and their influence on the implementation of ICTs in schools revealed the following responses from the study sample. 77%(16) respondents indicated that there were inadequate appropriate ICT rooms in the study schools while 20% (4) indicating that rooms were adequate while 3%(1) citing poor rooms

for appropriate implementation of ICTs in the schools. The Table below shows the study findings.

Table 4.4.1 adequacy of appropriate ICT rooms in the schools.

Adequacy of rooms	f	response
Inadequate	16	77
Adequate	4	20
Poor	1	3
Total	**21**	**100**

From Table 4.4.1 it can be deduced that available rooms are not adequate for ICTs implementations in the study schools with 77%(16) of the study responses, this findings is in line with Patti (2008) who indicated that a country's education technology infrastructure sits on top of the national telecommunications and information technology infrastructure. Availability of adequate infrastructure to support the development of ICTs in schools is a tremendous challenge that schools in Kenya currently face. A part form the high initial costs, as well as the best and efforts of supporting such infrastructure, the maintenance and upgrade costs, as well as the process of setting up the requisite infrastructure are roadblocks to the successful usage of ICTs in schools especially in poor and remote areas. Saleemi (2009) also tends to agree with the findings when he asserts that before any ICT based programme is launched, policy makers and planners must carefully consider in the first place appropriate rooms or buildings The existing rooms in schools were build without the mind of technology change. They therefore remain unconducive for both upgrading and renovations.

4.4.2 **Availability of requisite infrastructure for ICTs implementation.**

Investigation to determine whether the schools have the requisite infrastructure to anchor ICT implementation revealed the following responses. 81 % (17) indicated unsatisfactory requisite infrastructure, while 10% (2) indicating that there were good requisite infrastructure for ICTs implementation in schools while 3% (1) asserting that the requisite infrastructure were available and excellent for ICTs implementations. The table below summarizes the study findings.

Table 4.4 availability of requisite infrastructure for ICTs implementation

Requisite infrastructure, f		% responses
Unsatisfactory	18	87
Poor	0	0
Good	2	10
Very good	0	0
Excellent	1	3
Total	**21**	**100**

From table 4.4 it can be deduced that most schools under study have unsatisfactory requisite infrastructure for ICTs implementation with 87% responses this is in line with Saleemi (2009) who asserts that most school have old buildings, poor electric wiring, heating and cooling installation and poor ventilation and hence negatively impacting in the implementation of ICTs in schools. Most schools are also far from the sources of electricity and nearness to telephone is still miles away. Policy makers are also challenged by the ubiquity of different types of ICTs in the education systems requiring different infrastructures. Different providers of ICT infrastructure have provided varied versions which live final users unable to adjust to the rapid changes.

4.5 ICTs awareness and ICTs implementation in public schools.

Investigation to determine the extend of ICTs awareness and its implementation in public schools enlisted the following responses.

4.5.1 Level of ICT awareness in the schools.

Investigation to determine the level of ICT awareness in the study schools enlisted the following findings from the study respondents. 80%(17) of the respondents indicated that they were aware of ICTs use in the education while 20% (4) of the respondents indicating a general lack of awareness about the utility of ICTs in education the table below shows the study findings.

TABLE 4.3 level of ICTs awareness in the schools.

Level of awareness, f		response
Aware	17	81
Not aware	4	19
Total	**21**	**100**

From Table 4.3 above it can be deduced that the respondents are aware of the ICTs utility in education with 84% responses, the study finding is in line with Patti (2008) who asserted that although may educator (education policy makers) are aware of ICTs utility in education many have found it particularly difficult to deploy ICTs in the field of education. Most respondents agree that ICT use could drastically transform the service delivery, however, they continue remaining optimistic that one day ICT will be fully implemented.

4.5.2 Technical support skills on ICT implementation in Public schools.

On ICTs technical support skills in relation to ICTs implementation in public secondary schools, the researcher posed a question that enlisted the following findings:- 90%(19) of the respondents indicated ICT implementation was further limited by lack of technical support skills, while 10% (10) indicating that lack of adequate training in ICTs implementations. The table below shows the study findings.

TABLE 4.4 Technical support skills on ICT implementation in public schools

Technical skills	f	response
Lack of technical support skills	19	90
Inadequate ICT Training	2	10
Total	**21**	**100**

From Table 4.4 it can be revealed that ICTs implementation is further limited by problems with technical support skills with 90%(19) responses, this is in line with the research findings by Blever (2008) when he asserted that in most schools ICTs implementation is limited by technical difficulties as major barrier to usage and a source of frustration for students and teachers. A technical school in lukexbourg stated that "technical problems further asserts that school lacked permanent technical staff to solve these general maintenance and technical problems, so that computer teachers found themselves overwhelmed with this responsibility(technical) as well as teaching. Most teachers double up as technicians during and after classes so as to maintain the computers. The limited skills on computer maintenance not only burdens teachers but also risk the computers from frequent breakdown.

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4.5.3 Appropriateness of ICT equipments in the study schools

On investigation to determine the appropriateness of ICT equipments for the purpose and needs of the schools the researcher posed a question that revealed the following responses.76%(16)respondents sited occational breakage of the machine while 24(5) indicating general lack of awareness on the appropriates of ICTs equipments is the study schools. The table below shows the study findings.

Table 4.5. Appropriateness of ICT equipments

Appropriateness of ICT equipments	f	%	Responses
Occasional breakages	16	76	
Not aware	5	24	
Satisfactory	-	-	
Very good	-	-	
Total	**21**	**100**	

From table 4.5 it can be deduced that most ICT equipments are not appropriate they have occasion breakage 76% responses, this is also in line with Haddad (2003) who asserted that most ICTs equipments systems often breaks down leading to frustrations of the effectiveness of the machine s, half the computers don't break or the printers don't break, after that shows numerous times, people stop using them. They don't tolerate so much. Most schools have computers which worked for a few years and broke down ,these computers are either obsolete or irrepairable.This coupled with dumping of second hand computers creates areal problem.

4.5 Principles Attitude towards ICTs Implementation in Public Schools.

A number of studies (e.g. coxeted, 1999; mantas 2000; Grainger so tolhasst 2005) have shown that there are made large of factors which influence distress under utilization of ICTs in their teaching. In the current study researcher posed a question on the principals attitude towards ICTs implementation and the following were the study findings.

4.5.1 Principals Attitude towards ICT technology.

Investigation to determine the principals attitude towards the new technology revealed the following responses from the study sample.67 %(14) indicated a positive attitude towards the implementation of ICTs, while 25 % (5) indicated that principal's attitude was negative due is computer-phobia while 8%(2).respondents were undecided. The tabble below shows the study findings.

Table 4.2 principals' attitude towards ICT implementation

Category	freq	%response
Positive	14	67
Negative	5	25
Undecided	2	8
Total	**21**	**100**

From Table 4.2 it can be deduced that principals' attitude towards ICTs implementation is positive with 67%(14) and 25%(5) of the total responses was negative. This is supported by AjzenI,fishbein,m(2005),rogers,E.M(2003)and then,c(2002) who conducted a case study on pre-school principals practices in the use of ICT and reported that principals attitudes towards technology are important to determine the extent to which computers are used in schools. Appositive attitude towards the technology by the principal are very helpful and supportive in introducing these new technologies into the school. For example if the principals attitude is positive, then they encourage their colleagues to have ICT training,

equip the school with sufficient computer and ensure that staff has access to relevant technology.

4.5.2 **Indifferent attitude towards ICTs implementation in the school.**

Investigation to determine the indifferent attitude toward the implementation of ICT in schools revealed the following responses. 28 %(6) of the respondents cited technophobia as a major hindrance in using ICT technology a strong limitation to its implementation. The table below shows the study findings.

Table 4.5 indifferent attitude towards ICTs implementation in the school.

Category	f	%response
Technophobia	17	82
Lack of self-confidence	4	-18
More responsibility	0	--
Lack of relevance	0	-
Total	**21**	**100**

From table 4.5 it can be deduced that technophobia towards ICT implementation is an indifferent attitude towards the implementation by 82%(17) a long side lack of self-confidence with 18%(4) responses. This view is supported by Becta (2003) who asserted that computer –phobia is argued to be a major deterrent to the utilization of ICT by educators, it's believed that capabilities and constraints determine the efficiency(real and perceived) of an individual's taking particular actions(stern,dietz,abel,guagrance so ka/of 1999). For many teachers who may have the capability it will be a strong limitations.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter deals with the summary of findings, conclusion and recommendation

5.2 Summary of Findings

5.2.1 Demographic details

The study deduced that most teachers had acquired high education with 74.2% citing that most teachers had a bachelor degree in education with 6.6% citing a master's degree. This indicate that the teachers are up to the task of ICT implementation.

5.2.2. List of ICTs infrastructure in relation to ICTs implementation.

- It can also be deduced that the current cost of ICTs equipment is expensive as indicated by 80% of the total respondents with 20% citing that they are not aware. These costs are inhibitive and contribute to low implementation level.

- The study findings also indicate that the Implementation process is unsatisfactory with 87% responses followed by 13% who indicate that it was adequate. The low rate of ICT implementation indicates insufficient effort and resources to fast-track the process.

- It can also be deduced that the study schools are barely sponsored with ICT equipments. The current level of sponsorship is low, skewed and erratic.
- The study findings also indicate that the initial cost of purchasing ICTs is high with 50%, followed by 30% installation cost and 20% maintenance costs. Due to many

costs incurred in ICT procurement and maintenance, many schools continue fearing to venture into investing in it. Lack of awareness on costs affects the utility of ICTs in education.

- On the technical support skills, it can be deduced that 90% indicated lack of technical support skills as a hindrance to ICTs implementation followed by 10% who indicated lack of adequate training in ICTs.
- The ICT infrastructure provided especially through sponsorship is not very appropriate due to occasional breakdowns.
- The study findings also indicate positive attitude towards ICTs implementation by the principals with 67%, followed by 25% citing negative attitude with 8% undecided.
- It was also deduced that 82% acted technophobia as the principals' indifference to ICT implementation followed by 18% lack of self- confidence by the principals.

5.3 Conclusions

Findings of this study hopefully will provide an objective point of view, which will benefit government and other stake holders in the education sector to collaborate and be aggressive on the implementation of ICTs in secondary school.

5.3.1 Cost of ICTs infrastructure in relation to lets implementation.

- It was found out that the cost of ICTs infrastructure in expensive in the study schools and its implementation costs is high, with high installation cost and maintenance costs.

5.3.2 Availability of adequate physical facilities in relation with ICTs implementation

- It was also revealed that the study schools lacked adequate ICT rooms, they had unsatisfactory requisite infrastructure for ICT implementation.

5.3.3 Level of ICT awareness in relation to ICT implementation.

- It was found that the study areas sampled population was aware of the ICTs utility in education. It was also deduced that there was lack of technical support skills to ICTs implementation; it was also revealed that occasional breakage minimize the appropriateness of ICTs in study schools.

5.3.4 Principals attitude towards ICT technology.

- It was also found that the principals attitudes towards ICTs implementation was positive, it was also deduced that their indifference was due to technophobia and lack of self-confidence.

5.4 Recommendations

5.4.1 Cost of ICTs equipment in relation to ICT implementation.

- The Kenya government should ensure that it provides equal financial assistance to all secondary schools so that the schools acquire the most appropriate ICTs facilities to aid in the teaching learning process. School stakeholders should also be encouraged to embrace unlimited use of ICTs in schools as its acknowledged as an important resource for socio- economic advancement in both developed and developing countries.

- Large investment should be done to enhance the integration of new technologies in the education subsector system, pedagogical, curricular as well as institutional innovativeness in this information age that provide unique opportunities that could potential promote education on a large scale.

5.4.2 Availability of ICT requisite infrastructure to ICTs implementation.

- Access to adequate technology is clearly a pre-requisite for successful ICTs integration in schools. A country's' education technology infrastructure sits on top of the national telecommunication and information technology infrastructure. The government should provide adequate infrastructure to support the development of ICTs in schools. Before any ICT–based programme is launched. Policy makers and planners must carefully consider in the first place, a basic requirement of appropriate rooms or buildings available to ensure proper housing of the technology. In schools whose many buildings are old renovation should be done to ensure proper electrical wiring, heating, cooling and ventilation and safety and security area enhanced. The availability of electricity and telephone should also be considered. The policy makers should also look at the ubiquity of different types of ICTs in the country in general and the educational system at all levels in particular, for instance, a basic requirement for computer based or online learning access to computer in schools, communities and humanities as well as affordable internet service.

5.4.3 Level of ICTs awareness and ICTs implementation in public schools.

- All the school stakeholders should be made aware about the utility of ICTs in education, as well as about the ICTs at our disposal and how they can be accessed and utilized economically and effectively. ICTs should be implemented after their appropriateness has been analyzed in terms of applicability and impact on various environments and context. In most developing countries, there is need to learn from the experience of other developed countries, but must also use technology to respondent to their own needs and not just follow trends. It's also considerate importance to consider basic ICT training of all the stakeholders.

5.4.4 Principals attitudes towards ICTs implementation.

- The principals should be encouraged to embrace utilization of ICTs in their teaching and management of their schools, this will include access to ICTs resources, quality of software and hardware, ease of use , incentives to change , support and collegiality in their school, school policies , commitment to professional learning and background in formal ICTs training. Therefore, altitudes of principals' should revolve in an educational innovation and proper understanding of the value of ICT and its benefits in the school environment.

5.5 Areas for Further Research.

The researcher recommends a more-in-depth study on the following areas

a. Impact of free secondary school on ICT integration in secondary schools
b. Influence of ICTs on student performance in K.C.S.E examinations
c. Factors influencing implementation of ICTs in Public secondary schools in other districts so as to compare the results.

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APPENDICES

Appendix 1. Letter of Introduction

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

REF: REQUEST FOR COLLECTION OF DATA.

I **Robert W. Wachiyie Reg. No. L50/66017/2010;** am a post-graduate student at the School of Continuing and Distance Education, University of Nairobi. I am conducting a research study titled "Factors influencing implementation of ICT in Public Secondary Schools in Teso North District in Kenya".You have been selected to form part of this study. Kindly assist by filling in the attached questionnaire. The information given will be treated in strict confidence, and will be purely used for academic purposes. Do not indicate your name or unwanted details on the questionnaire.

A copy of the final report will be availed upon your request.

Your assistance and cooperation will be highly appreciated.

Yours Sincerely,

Robert W. Wachiyie
Reg. No. L50/66017/2010,

Appendix 2. Research Permit from the Ministry of Education, Science and Technology.

Appendix 3. Questionnaire for Principals

Thank you for your interest in participating in this survey.

The purpose of this study is to collect data on the factors influencing implementation of ICT in Public Secondary Schools in Teso North District in Kenya.

This questionnaire is a part of Master of Arts in Project Planning and Management at the University of Nairobi, and is completely anonymous. Your answers will be treated with confidentially. Please indicate the correct option as honestly and as correctly as possible by putting a TICK (√) on one of the options. For the questions that require your opinion, please complete the blanks.

SECTION A: General Details (please check all that apply)

1. What is your age? 26-35 ☐ 35-40 ☐ 45-50 ☐ above 50 ☐
2. What is your Gender? Female ☐ Male ☐
3. What is the Level of your School? District ☐ Provincial ☐
4. Where is your situated? Rural ☐ Urban ☐
5. What douse computers for?
   - i. Exams ☐
   - ii. Teaching ☐
   - iii. Office work ☐
   - iv. Others ☐ Please Specify.....
6. In your opinion what factors favorably influence ICT use in your school .....

.....

.....

7. As a principal, what challenges do you experience in ICT implementation in your school

.....

.....

8. Has the use of ICT made your work/ programmes in your school easy? Yes ☐ No ☐

9. Does the school have a technician for computers? Yes ☐ No ☐

SECTION B: Factors Influencing Implementation of ICT in Public Secondary Schools in Teso North District.

Please use a tick (√) in appropriate boxes ☐

10. Are the computer supplied by a sponsor/NGO to your school? Yes ☐ No

11. Are computers supplied by the government to your school? Yes ☐ No ☐

12. Does the school have enough facilities for teaching computer to students? Yes ☐

No ☐

13. Who does the maintenance of your computers? .....

.....

14. What is the cost of maintaining your computers annually? Yes ☐ No ☐

15. Is there enough room for computers (computer lab)? Yes ☐ No ☐

16. Is there enough room for students who learn computer? Yes ☐ No ☐

17. Are all offices connected with computer? Yes ☐ No ☐

18. Is your school connected to the internet? Yes ☐ No ☐

19. Name the types of computer that you have ....

20. What role is ICT playing in your school..... ....

21. Comment about the use of ICT and traditional information system e.g. use of typewriter

22. How do you feel about computer use in your school? Can it be the cause of development differences between those who have computers and those without?

Appendix 4. Questionnaire for HOD teacher

Thank you for your interest in participating in this survey.

The purpose of this study is to collect data on the factors influencing implementation of ICT in Public Secondary Schools in Teso North District in Kenya.

This questionnaire is a part of Master of Arts in Project Planning and Management at the University of Nairobi, and is completely anonymous. Your answers will be treated with confidentially. Please indicate the correct option as honestly and as correctly as possible by putting a TICK (√) on one of the options. For the questions that require your opinion, please complete the blanks.

SECTION A: General Details (please check all that apply).

1. What is your age? 26-35 ☐ 35-40 ☐ 45-50 ☐ above 50 ☐
2. What is your Gender? Female ☐ Male ☐
3. What is the Level of your School? District ☐ Provincial ☐
4. Where is your situated? Rural ☐ Urban ☐
5. What do computers for?
   - v. Exams ☐
   - vi. Teaching ☐
   - vii. Office work ☐
   - viii. Others ☐ please specify.....
6. As a principal, what challenges do you experience in ICT implementation in your school

   .....

   .....
7. Has the use of ICT made your work programmes in your school? Yes ☐ No ☐

SECTION B: Factors Influencing Implementation of ICT in Public Secondary Schools in Teso North District.

8. How many computers do you have in your department ....

9. What is the shortfall in relation to requirement.....

....

10. How often do you buy computers ....

.....

11. Who installs computers in your school ....

.....

12. What is the approximate cost of installation ....

.....

13. How often do you maintain your computers ....

.....

14. What is the approximate cost of your computers .....

.....

Do you have enough computers in your office/department? Yes ☐ No ☐

15. Do you use internet services? Yes ☐ No ☐

16.

17. Are your computers of the same type? Yes ☐ No ☐

18. Do all teachers in your department have computer knowledge? Yes ☐ No ☐

19. Other than office work give other uses of computer in your department .....

.....

20. Please rank the use of computer in your department on the scale below:-

i. All teachers use computer

ii. Some teachers use computer ☐

iii. No teacher uses computer ☐

21. In your opinion how can ICT be effectively implemented in your department

.....

.....

Appendix 5: Budget

It is estimated that the project will cost approximately **Kshs. 57,100/=**

The cost that will be incurred is as follows:

	ITEM	**COST (in Kshs.)**
1	*Literature reviews*	
	• Computer	12,000.00
	• Stationery	6,000.00
2	Questionnaire design	1,000.00
3	Pre-testing questionnaire	2,000.00
4	*Data collection*	
	• Field expenses	5,500.00.00
5	*Data Analysis*	
	• Computer	15,600.00
6	*Report writing*	
	• Secretarial services	15,000.00
	GRAND TOTAL	**57,100.00**

Appendix 6. Work Plan

MONTH	MID FEB. 2012	MARCH 2012	MAY 2012	JUNE 2012	JULY 2012
Activity					
Submission of draft proposal					
Review of supervisors comments					
Pre-testing questionnaire					
Data collection					
Data analysis					
Report writing					
Submission of report					