

**CHALLENGES FACING PRINCIPALS IN INTEGRATING INFORMATION
COMMUNICATION TECHNOLOGY (ICT) FOR EFFICIENT MANAGEMENT IN
SECONDARY SCHOOLS IN NYAMIRA COUNTY, KENYA**

BY

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF
EDUCATIONAL MANAGEMENT, POLICY AND CURRICULUM STUDIES IN
PARTIAL FULFILMENT OF THE REQUIREMENTS OF MASTER OF
EDUCATION DEGREE**

KENYATTA UNIVERSITY

SEPTEMBER 2011

DECLARATION

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

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DEDICATION

This work is dedicated to my wife Nelly for her encouragement. Without her encouragement this could have not been possible. I would like to give appreciation to my brother Dr. Tom Mageto for encouraging me. Finally, the work is dedicated to my loving Father Andrew Ombui and Mother Joyce Kwamboka who not only brought me up to be what I am today but they have been a constant source of encouragement during trying moments of my life.

Table of Contents

DECLARATION	i
DEDICATION	ii
Table of Contents	iii
List of figures and tables	v
ACKNOWLEDGEMENTS	vi
LIST OF ABBREVIATIONS AND ACRONYMS	vii
Abstract	viii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Introduction	1
1.2 Background to the study	1
1.3 Statement of the problem	13
1.4 Purpose	14
1.5 Objectives of the Study	14
1.6 Research questions	15
1.7 Assumptions of the Study	15
1.8 Limitations	15
1.9 Delimitations	16
1.10 Significance of the study	16
1.11 Conceptual Framework	18
1.12 Operational definition of significant terms	19
CHAPTER TWO	20
REVIEW OF RELATED LITERATURE	20
2.1 Introduction	20
2.2 History of computers in Education	20
2.3 Introduction of ICT in Kenyan schools	23
2.4 Challenges linked to the integration of ICTs in schools	24
2.5 School management system	26
2.5.1 IT and School Management	27
2.5.2 Available applications and their use	28
2.5.3 Factors determining system use and impact	29
2.5.4 The Computer as Decision Making Tool in School Management	30
2.6 Government of Kenya ICT policies	31
2.6.1 The Central Government	31
2.6.2 ICT in the Education Sector	32
2.6.3 Use of ICT in Kenyan Schools	32
2.7 Investment of ICT in Kenya education sector	33
Summary of the literature reviewed	35
CHAPTER THREE	36
RESEARCH METHODOLOGY	36
3.1 Introduction	36
3.2 Research Design and locale	36
3.3 Target Population and Sampling	37
3.4 Research Instruments	37
3.4.1 Piloting of the instruments	37

3.5 Data collection Techniques.....	38
3.6 Data Analysis	38
CHAPTER FOUR.....	39
DATA ANALYSIS, PRESENTATION AND DISCUSSION.....	39
4.1 Introduction.....	39
4.2 Principal characteristics	39
4.3 Experience of the principals in the teaching profession and as principals	40
4.4 Academic qualification	42
4.5 Number of years for the principals in their present stations	42
4.6 School enrolments.....	43
4.7 ICT literacy levels of the principals.....	44
4.8 Number of computers in the schools and how they were acquired	46
4.8.1 Number of computers in the schools	46
4.8.2 Acquisition of computers.....	46
4.8.3 Types of Software used.....	47
4.9 ICT management uses.....	47
4.10 Internet connection.....	48
4.11 Recommendations in the use of ICT for school management	49
CHAPTER FIVE	50
SUMMARY, CONCLUSION AND RECOMMENDATION	50
5.1 Introduction.....	50
5.2 Summary	50
5.3 Conclusions.....	51
5.4 Recommendations.....	52
5.5 Recommendations for further research.....	53
REFERENCES	54
Appendix 1.....	56
Questionnaire	56
Appendix 2.....	60
Time schedule	60

List of figures and tables

Figures

Figure 1.1: conceptual framework	18
Figure 2.1: The relations between design use and effects of IS.....	29

Tables

Table 2.1 Time-frame for each stage of CASA development in seven countries (based on 1991 data).	27
Table 4.1 Ages of the principals	40
Table 4.2 Experience of the principals in the teaching profession	40
Table 4.3 Experience as principals	41
Table 4.4 Academic qualifications of the principals	42
Table 4.5 Number of years for the principals in their present stations	42
Table 4.6 School enrolment	43
Table 4.7 Computer literacy of the principals	44
Table 4.8 Level of computer literacy	44
Table 4.9 Number of computers in the schools	46
Table 4.10 ICT management uses.....	48

ACKNOWLEDGEMENTS

Though the writing of this work is an individual affair, the contributions of my lecturers cannot be underestimated; they made this work possible by contributing in their own ways. My appreciation goes to Dr. Norbert Ogeta, Dr. Mary Otieno, M/S Githongori, Mr. Gatimu Kiranga, Dr. Andrew Riechi and Dr. John Orodho who became an eye opener in writing this work. The writer would also like to acknowledge all those who have contributed in one way or the other for I cannot be able to thank you all.

LIST OF ABBREVIATIONS AND ACRONYMS

BOG	-	Board of Governors
CASA	-	Computer Assisted School Administration
CEPAK	-	Computers in Education project of the Aga Khan
DSS	-	Decision Support System
ICT	-	Information communications Technology
IS	-	Information System
IT	-	Information Technology
ITEM	-	Information Technology in Education Management
KESSP	-	Kenya Education Sector Support Programme
LAN	-	Local Area Network
MIS	-	Management Information Systems
MoEST	-	Ministry of Education Science and Technology
OECD	-	Organization for Economic Cooperation and Development
PTA	-	Parents' Teachers' Association
SIS	-	School Information Systems
SMS	-	School Management System
SSA	-	Sub-Saharan Africa
TSC	-	Teachers' Service Commission

Abstract

This study examines the challenges faced by Kenyan secondary school principals in the use of ICT in enhancing school management. The study investigated computer literacy levels of secondary school principals, challenges faced by principals in integrating ICT for management and acquiring computer hardware and software, extent in which ICT is being used in management and the recommendations which can enhance the principals use ICT for management. The target groups of schools under the study were schools situated in a rural district where we have weak infrastructure and limited facilities in terms of transportation and other means of communication. The study was conducted in 30 secondary schools in Nyamira District in Kenya selected purposefully using availability of electricity as the criteria for selection. Data collection methods included closed and open ended questionnaires for the principals and observation. The data collected was analyzed by tabulating the responses from the 30 respondents and processed manually using frequency counts and percentages. The study findings showed that ICT as a management tool was not used effectively to address management issues. The study also revealed that ICT was being used for clerical issues and to a limited extent on little management issues particularly the processing of examinations. The major challenges facing the principals was lack of funds to acquire computer hardware and software, lack of exposure on the capabilities of ICT to ease management work, and lack of adequate training in ICT for the principals. The findings of the study suggest that for successful implementation of ICT for management in Kenyan secondary schools, strategies that include the financing of ICT infrastructure by the government and other stakeholders, capacity building and the formulation of an ICT policy is required to address the issue of management in secondary schools. Equally adaptation of strategies used elsewhere in the world could be employed.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter contains the background to the problem of the research, the purpose and objectives and the research questions. It also gives the assumptions the researcher had before commencing with the study. The limitation, delimitations and the significance of the study are also looked into. And finally it gives the conceptual framework of the study.

1.2 Background to the study

Secondary education is a gateway to the opportunities and benefits of economic and social development. Demand for access to higher levels of education is growing dramatically as countries approach universal primary education. The global Education For All (EFA) efforts provides added momentum for the growth in secondary education. Furthermore, globalization and the increasing demand for a more sophisticated labor force combined with the growth of knowledge-based economies give a sense of urgency to the heightened demand for secondary education (World Bank, 2011).

In countries with an improved secondary education many benefits have accrued, but the major benefit is the creation of an effective human capital. The crisis facing human resource development in Africa is clearly manifested in the secondary education sub-sector in forms of limited access and poor quality (Evoh, 2007). The World Bank (2005) describes secondary education as the crucial link between primary schooling, tertiary education and the labor market. The task confronting education policy makers in Africa is to transform secondary education institutions and current schooling practices to align them with the fast growing demands of

globalization and technology-driven world. Policy makers and educators must address the twin challenges of increasing “access to” and “quality and relevance of” secondary education for all young people. And secondary education systems everywhere will need to be more flexible, relevant and responsive to both local needs and the global environment in the 21st century. Secondary education is now being recognized as the cornerstone of educational systems. Quality secondary education is indispensable in creating a bright future for individuals and nations alike (World Bank, 2011).

In almost all OECD countries the level of educational attainment is on the rise, “on average, three quarters of people born in the 1970s have gone all the way through secondary school”. Secondary schooling is now an essential requirement of successful entry into the labor market (World Bank, 2008). Furthermore, employers in the developed world seek employees with knowledge, skills, and the ability to solve problems, and may measure these through assessments. For employers, educators, and the public, the emphasis has shifted from education inputs to education outcomes. For the outcomes of secondary education to be realized there is need for good management in these schools, this is where technology becomes a tool which can be used to enhance it.

Technology is virtually ubiquitous in the workplace in the developed world. Its use is measured in various studies which show, for example, that in Europe, “ICT skilled employment has generally increased in EU15 countries” (OECD, 2004). In Japan, slightly more than 60% of jobs in information and research services employ people with ICT skills (World Bank, 2008). This shows that there is a connection between information and technology and the need for an ICT-

skilled labor force to improve the production of information and knowledge. In the United States, over 30% of people working in lumber and building material retailing use ICT (OECD, 2004).

Secondary education is of strategic importance to Africa's development and capacity building, particularly because students of secondary school age and young people in general make up more than 60% of the population in Africa (Evoh, 2007). Unfortunately, many African countries are unable to meet the increasing demand for secondary education due to their inability to build on the successes of the universal primary education system. African countries are expected to double or triple the number of primary school graduates. This massive turnaround is due to the success of the universal primary education system under the Education For All (EFA) programs (Evoh, 2007).

Kenya has an 8-4-4 education system. Primary schooling takes eight years, followed by four years of secondary schooling and four years of first degree studies at university. Kenya introduced universal, free, non-compulsory access to primary education in 2003 that led to an immediate increase of 1.3 million students. This growth has created an accumulating demand for access to secondary education and predictably, tertiary education as well (Farrel, 2007). Furthermore, the introduction of free day secondary schooling in 2008 has led to increased enrolment in secondary schools.

The school, as the most local education unit, has become a locus of demand for accountability, and school principals as leaders of their schools, are charged with making their school perform (World Bank, 2008). Education and schools in the 21st century are facing many challenges to

make education relevant for what is referred to as the information or the knowledge society. Educational institutions in which administrators, managers, teachers are working need massive and rapid computerization systems which will help them carry out management of this institutions so as to improve their performance, effectiveness and efficiency.

The use of ICT in secondary schools can be considered an index both of modernization of secondary education in general and vocational education in particular, and also an index of the degree of adaptation to the global economy (World Bank, 2008). The incorporation of information technology (IT) into day-to-day activity of schools is not merely a technical oriented issue, but rather has a strong and overall impact on the entire school structure and dynamics (Barta et al, 1995). IT assimilation in schools constitutes a big challenge for schools in Kenya. An integrated system has the potential to support teacher's and administrators' work. Information systems can rescue complex student data before it is reduced for administrative purposes or parental convenience.

A school wide area network enables automation of a variety of processes. Beginning with library automation, maintenance of records, student tracking, resource planning, using the existing ICT infrastructure will increase efficiencies. At the same time, savings in cost, time and effort will also accrue. The school wide local area network will be used to facilitate this automation (Republic of India, 2009).

Information communication technology (ICT) has become indispensable in modern societies to process data and save time and effort. A dependable information system is essential for efficient

management and operations in schools. Technology has become commonplace in all aspects of our lives. Over the past 20 years the use of media and information technology has fundamentally changed the practices and procedures of nearly all endeavors within business and governance.

The use of ICT in secondary schools is costly, it requires a number of conditions that are not easily satisfied in Sub-Saharan Africa (SSA) countries (for example, stable supply of electricity, training of teachers, and ongoing maintenance of machines). What is necessary for the effective use of ICT, and what is required to make this possible at what levels of education are problems that SSA educational system are not likely to solve with significant levels of private-public partnerships (World Bank, 2008).

Using ICT may not save time at first, because it takes time to learn how to use computerized programs. Nevertheless, after well organized training significant amounts of time could be saved by using ICT and more quality time could be spent on school's objectives and aims.

Schools, which until recently were lagging behind in the implementation of IT in their administration and management, are now attempting to close the gap. There is need for a massive and rapid computerization process in schools which will make computers an integral part of the educational management scene. A computer on the desk of every secondary educational management staff might become a reality in the near future (Barta et al, 1995).

Management Information Systems (MISs)/Decision Support Systems (DSSs) are being implemented with the aim of providing meaningful support for school employees in their daily

activities, and to improve their performance, effectiveness and efficiency. Much like at universities, usable and accessible school databases are being established, encompassing data on students, teachers, employees, classrooms, courses grade levels, students achievements and behavior, school space, curriculum, finance, inventory and transportation. The MIS provides school employees with new tools which should support them in a variety of activities such as student placement, teacher allocation to classes, construction of school timetables and examination schedules, assignment and disbursement of resources, follow up on decision implementation, analysis of teacher and school achievements. IT implementation is also invigorated by office automation tools such as word processing, electronic mail, electronic archives, spreadsheets, automatic follow up of decisions, electronic appointment books, automatic dialing and desktop publishing (Barta et al, 1995).

Kenya Vision 2030 is the nation's new development blueprint of 2008 to 2030 which aims at making Kenya a newly industrializing, "middle income country providing high quality life for all its citizens by the year 2030" (NESC, 2007). The plan demands the improvement of educational management from every educational institution according to the principles of performance, efficiency and effectiveness. The mission to increase performance, efficiency and effectiveness by disallowing room for waste and fully utilizing scarce resources, if successful, will minimize the cost of education, thereby producing an education system with world-class management, superbly organized, effectively run and acutely responsive to changing needs and situations. One of the ways this can be made possible is if our education system is ensconced whereby teacher training, school administration, school aspiration and practical facilities are complete.

In Republic of Kenya (2005) the Ministry of Education (MOE) suggests that ICT integration concepts used in the TTC model can be adapted for secondary school teachers and students. In addition, the Ministry of Education has National ICT strategy, which highlights the potential of ICT to help support implementation of Free Primary Education (FPE) and to address emerging challenges such as; overcrowded classrooms, high Pupil Teacher Ratio (PTR) particularly in densely populated and semi-arid areas, shortage of teachers on certain subjects or areas and relatively high cost of learning and teaching materials (Republic of Kenya, 2006). The government therefore recognizes the role of ICTs in the social and economic development of the nation and has promulgated a national ICT policy. Republic of Kenya (2006) National Information and Communications (ICT) Policy is based on four guiding principles; infrastructure development, human resource development, stakeholder participation and appropriate policy and regulatory framework.

The lack of adequate ICT infrastructure has hampered provision of efficient and affordable ICT services in the country. Emphasis is placed on: Provision of support infrastructure, such as energy and roads, supporting software development, Promotion of local manufacture and assembly of ICT equipment and accessories and Provision of incentives for the provision of ICT infrastructure.

On human resource development the government recognizes the role played by the various institutions providing ICT education and training. However, there is need to strengthen and streamline the training through: Promoting ICT in education at primary, secondary, tertiary and community levels by developing ICT curricula and ensuring that teachers' trainers possess the

requisite skills. The setting up of a framework for evaluating and certifying ICT training programs, developing a mechanism for attracting and retaining skilled human resources; and developing strategies to support research and innovation.

On universal access, ICT services are limited to a few major towns leaving out the rural areas of the country where most Kenyans live. There is therefore need to enhance universal access through: Provision of adequate resources to the ICT sector, developing the requisite ICT infrastructure, creating incentives for service providers to deploy services in rural and underserved areas, establishing a Universal Service Fund, creating awareness of benefits of ICT to the public and developing knowledge sharing networks at grassroots level.

The broad objectives of the IT policy includes among others: Using e- government as a tool to improve internal efficiency and quality of public service delivery and help in the fight against corruption. Encouraging the use of IT in schools, colleges, universities and other educational institutions in the country so as to improve the quality of teaching and learning, and providing adequate infrastructure in the country for IT sector to flourish.

The use of computers in secondary schools can have a great impact on how principals manage their schools. The Government of Kenya stresses that IT is a tool of production and efficiency to better transparency in the functioning of administration. The work of a secondary school principal has become more demanding due to increase in enrolment brought about by subsidized secondary Education thus making the use of ICT more important.

Oloo (2009) in a survey carried out, data was collected from a cross section of heads of departments, IT teachers, deputy principals and principals. Data were collected from two primary, fifty two secondary and two technical training colleges to determine the current use and attitude towards ICTs use in schools. It was found that: There was a wide range of use of computers in the schools and colleges surveyed. It was also found that administrative use and examination processing were the most frequent followed by teaching of basic computer skills. Most schools felt they were financially constrained and the little money they had would rather be spent on administrative support service. Most of the schools had purchased schools management software and that the common modules bought by schools were examination, timetabling and accounting module. It was also found out that Schools acquire computers either through donations or school fund and most schools felt that they did not have adequate funding to purchase ICT equipment and would consider buying them for administrative purposes. Majority of the schools surveyed did not have internet connected to the computer(s) and a high percentage of schools interviewed reported they did not have dedicated technicians to service their computers. From this study, it shows that schools in the country have not embraced the use of technology due to impediments which could be overcome by other means.

The head teacher's leadership role is more important than ever in these changing times. One who can be alongside colleagues; one who takes initiatives and encourages others to do so as well; one who brings a wide vision to the school's role in the community as a whole; one able to help others to overcome weaknesses and is prepared to recognize his or her own (Owen, 1992).

Principals should develop and demonstrate new skills of institutional leadership appropriate to the new circumstances brought about by change. They are required to manage the institutions in which they head more cost effectively by reviewing priorities and choices in the face of acute resource shortage.

According to Owen (1992), the head has and needs fully to exercise a proactive role, spotting the opportunities as well as the hazards which lie ahead and be aware at all times that he or she will have with fluency and credibility to explain and justify what is being done for the benefit of the schools pupils and why. The educational administrator is called upon to exercise powers with imaginative informed interpretation, but educational administration is subject to check.

“It used to be repeated that a school was only as good as its head”. But now “A school is only as good as its management” (Owen, 1992).

Planning for the school is part of the principal’s responsibility. Planning is the fundamental activity of educational administration in all its various aspects and at all levels of operation. The authority will probably already have a policy upon the matter which the planner is about to tackle. It may be a policy to have no policy; or it may be a policy which needs changing but in either case it will have collected around itself a set of public expectations, political implications and assumptions in the clerical and administrative staff which together constitute a formidable inertia (Brook, 1989).

What we need is a more coherent picture that people who are involved in or affected by educational change can use to make sense of what they and others are doing (Sarah and Trafford,

1990; 219). An ill informed administration can substantially frustrate change earnestly desired by the majority.

Rationalization has underpinned the introduction of computers for administrative use without schools perceiving this as a threat. Senior staff expects that the use of computers will mitigate some of the negative results of previous staffing reductions, without any adverse effects. So far computer systems have been used primarily for administrative tasks which head teachers and other staff regards as chores and for which they have been pleased to relinquish some control in return for a system which increases administrative efficiency (Sarah and Trafford, 1990; 83).

We paid the price for not taking part in the industrial revolution of the late 18th Century because we did not have the opportunity to see what was taking place in Europe. Now we see that information technology has become an indispensable tool. We can no longer sit and watch passively (Hawkridge, Jawaorski, McMahan, 1990).

The knowledge regarding the development and implementation of computer-assisted information systems in schools has been growing in many countries since the 1980s. Information technology and information systems are rapidly becoming essential to management in almost all fields. Systems which provide such information help people to make internal processes more efficient, integrate business functions and link an organizations suppliers and customers. It is clear that organizations and consequently schools depend on information systems to support the flow of data, information and knowledge about inputs, outputs, relationships among different environments (Maki, 2008).

ICT should be implemented as an aid to meet goals and carry out tasks related to school management and administration (Brooks-Young, 2006). ICT plays a vital role in supporting powerful school leadership and efficient management and administration. Within school, administration needs to provide a solid base on which school functioning and decision making are supported. ICT implementation in schools for both managerial and educational reasons, presupposes the preparation of school context in order to easily accept and adopt change.

Policy makers in Kenya provide guidelines almost in every school actions; this gives secondary school principals minimum levels of autonomy in leading their schools to meet educational goals and reaching high performance standards. Since the introduction of free day schooling in secondary schools in 2008, funding has been from the central government, this has been an impediment to the development of secondary schools since the money from the central government has specified uses in the schools.

Little is done in Kenya regarding ICT in school administration and management. According to Lancaster (1989), “in attempting to manage information as a resource, many organizations are turning to formal management information systems, a network to provide the right information to the right person at the right time at minimum cost (cited in Maki, 2008).

1.3 Statement of the problem

It is not uncommon to find that many establishments in Kenya, including educational institutions, still keep records in files and tuck them away in filing cabinets where they accumulate dust. Many of the files end up being eaten by rodents and cockroaches thus rendering them irretrievable, furthermore it becomes rather difficult to search for a file that has been misplaced. A great deal of routine administrative work in government establishments is still done manually with the government showing little interest in embracing ICT.

Schools in Kenya are burdened with varieties of tasks, mostly not planned but imposed upon them due to unforeseen circumstances. School management sacrifices so much time and effort to increasing demands such as tournaments, be they academic or non academic, from grassroots to the national level.

In Kenya, administration and management in schools include the management of office, personnel, student affairs, student registration, curricular and extra-curricular activities, counseling, discipline, examinations, finance, and physical development. Most of these duties are delegated to the teachers.

Critical issues in school management include bureaucracy, de-empowerment and leadership. This trend does not seem likely to depart from Kenyan school management arena. Alternatives are being sought to enlighten principals' workload whilst ensuring efficiency and effectiveness in administration, thus, ICT comes into the scene.

Countries that have harnessed the potential of Information and Communications Technologies (ICTs) have attained significant social and economic development. In addition, they are rapidly transforming into information and knowledge-based economies.

It is evident that in most schools the teachers and principals are still using the old ways of processing student data. The exercise is usually time consuming and can cause confusion and panic especially during the closing of schools. Introduction of computers in these schools can go a long way in helping the support staff, teachers and the principal in lessening their work such that the extra time can be used for other chores of the school thus making the school to perform better, be more efficient and be more effective. Therefore, there is need to find out whether introduction of ICTs in secondary school management in Kenyan schools has been accomplished.

1.4 Purpose

The purpose of this study was to examine the challenges facing principals in integrating ICT for efficient management of schools in Nyamira District in Kenya.

1.5 Objectives of the Study

1. To find out the computer literacy levels of secondary school principals in Nyamira District.
2. To establish challenges faced by principals in the integration of ICT in management of secondary schools in Nyamira District.
3. Establish the challenges that are faced by principals in the acquisition of computer hardware and software for management in Nyamira District.

4. Determine the extent to which ICT is being used in school management in Nyamira District.

1.6 Research questions

1. To what extent are the school principals able to use information technology in educational management?
2. What are the challenges facing the principals in integrating ICT in the schools?
3. What are the challenges principals are facing in the acquisition of computer software used in management?
4. To what extent is ICT being used in the management of schools?

1.7 Assumptions of the Study

Some assumptions were made before commencement with the study, and these were that the respondents would be truthful and that there were major constraints hindering the integration of ICT in secondary school management.

1.8 Limitations

1. The study was conducted in public secondary schools in Nyamira district which is a small proportion of the Kenyan Schools population.
2. There was lack of adequate research done on ICT in secondary school management in Kenya. Therefore, it was not possible to use related literature on ICT and secondary school management in Kenya to adequately support or disapprove the study. However, the literature from other countries was used.
3. The researcher used a questionnaire and observation as the only instruments of data collection.

1.9 Delimitations

Only schools with electricity were considered for the study. And only principals of these schools in the study were given the questionnaires.

1.10 Significance of the study

ICT has an important implication for the education sector. Currently ICT is not only a host to new industries and services but also an enabler. Innovative use of ICT therefore offers enormous potential benefits. Development of ICT in the schools will increase efficiency and effectiveness and can make schools to be more responsive. In this regard the challenges which were identified from the study can be used as an information gathering mechanism for schools as they plan strategies for ICT implementation. The study can help the MOE to better understand what impediments to ICT implementation exist and what initiatives can be required to overcome them. Nowadays students get results, fees balances and even selection through short messaging services (SMS) using mobile phones and internet easily and conveniently. The development of on-line shopping services and the creation of virtual shopping malls' have created large demands for local goods and services. It has also enabled competitive access to other markets for producer and consumer goods this increasing the welfare for the local citizen.

The significance of this research is to assist planners and decision makers to realize the “actual” roles played by ICT in the reform and the process of its implementation. The main feature of school management is the funding mechanisms and resources allocation policies adopted by various schools. It's then recognized that procedures for resources allocating which impact on every aspect of the operation of schools will ultimately determine its performances, effectiveness and efficiency, if students are to access quality education and have the opportunity to realize their academic potential.

The findings of this study can help the Teacher's Service Commission (TSC) during the appointments of principals and capacity building of teachers. It will help the curriculum developers to incorporate an IT curriculum in every institution training teachers so as to equip them with the requisite skills required in IT when they enter the profession. This will not only be for managerial work but also in carrying out their duties as teachers. These findings will also help the Board of Governors (BOGs) and parents' teachers associations (PTAs) of secondary schools to see the need of incorporating IT in the secondary school management.

1.11 Conceptual Framework

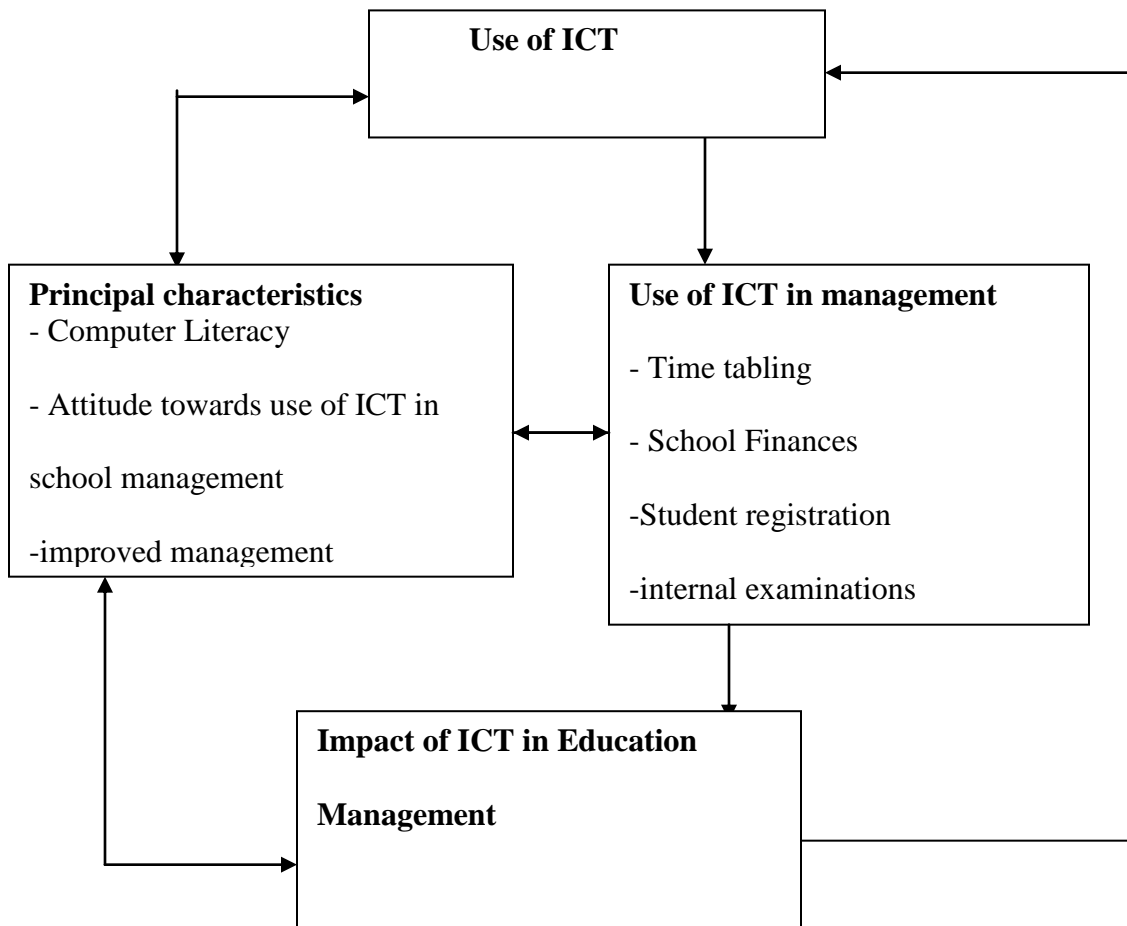


Figure1.1: conceptual framework

Source: Researchers own.

The conceptual framework shows that the principal is the implementer of management decisions. His computer literacy, attitude and improved management will have an impact on the schools management by using ICT.

1.12 Operational definition of significant terms

Computer- A machine that manipulates data according to a set of instructions

Electronic Mail- Method of exchanging digital messages

Database - An integrated collection of logically related records or files consolidated into a common pool that provides data for one or more multiple use

Hardware- General Term for the physical artifacts of a computer system

Informatics- A broad academic field encompassing artificial intelligence, cognitive science, computer science, information science, and social science.

Software-An application designed to help the user perform a particular task

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

In order for technology to interface with the technical core of educational organizations, educators and technologists or information systems specialists need to merge the realities of each of their worlds. The teachers and principals need to become acquainted with the capacity of the software and hardware of integrated information systems (Barta et al, 1995; 8). The issue of integrating ICT in school management has received little attention and yet this is supposed to be an issue that should have been addressed in the last century.

This chapter gives a brief insight of the history of computers in education in the world, and gives special attention of the situation in Africa. The need for use of ICT in schools and available applications and their use expounded. The factors determining system use and its impact in education management has also been given attention. Lastly, the Government of Kenya and its ICT policy has been given.

2.2 History of computers in Education

ICT is becoming increasingly used in schools and educational institutions, established in professional and classroom practice. However, although head teachers and policy makers continue to take increasing interest in the scope of this field, relatively little research work is being undertaken which considers aspects of ICT and school management (Passey, 2002). Looking for a relevant literature in the field of ICT and school management creates particular challenges, since involvement of ICT requires the inquirer to consider what the relevant domains of literature might be, as well as the source where ICT might be considered (Passey, 2002).

The use of computers in education started as a research activity on a very limited scale in the early 1960s. At that time computers were large and very expensive machines and the communication procedures was difficult and lengthy (Hebenstreit, 1992; 9). In the late 1960s however, the situation improved with the advent of the minicomputer and the invention of the time –sharing mode whereby many users at individual terminals could share the same computer at the same time.

In the early 1970s, the decreasing price of equipment and the increasing availability of time-sharing systems led to small scale experiment in schools in France, in the United Kingdom and in the United States which were funded by the government or by governmental agencies. Up to the late 1970s only the three advanced countries had made significant efforts to introduce computers into general education (Hebenstreit, 1992; 17).

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. Stimulated by governmental policies, and quite often led by the fear of losing the technology race, many countries started to build their own brand of microcomputers and distributed this to schools. Later near the end of the 1980s, the term ‘computers’ was replaced by ‘IT’ (information technology), signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term ‘ICT’ (information communication technologies) around 1992, when e-mail started to become available to the general public (Pelgrum & Law, 2003).

Between 1992 and about 1995, the investment in hardware, staff development and research programmes on ICT decreased. However, when the World Wide Web became available, the political interest in ICT was quickly boosted for a second time. This interest was accompanied by a commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society (Pelgrum & Law, 2003).

Advanced countries have applied a variety of strategies, closely linked to the structure of their education system and to past history, to the problem of introducing informatics in education. More recently, a number of developing countries have conducted pilot projects often co-financed by Western countries. In spite of the rate of innovation – which makes irrelevant today what was done only yesterday – some constants emerge from all the reports; the necessity of properly preparing teachers and decision makers, the importance of planning and fully implementing pilot projects, and the need to keep up to date with the technology (Hebenstreit, 1992;68).

It is certainly true that governments of developing countries have decided that computers are essential to satisfy the social and economic needs. Computers are at the heart of this revolution because they are very fast information processing machines. Provided they are programmed appropriately, their speed enables governments, institutions, companies and individuals to carry out a tremendous range of tasks that would be difficult or even impossible to do by other means. They are no substitute to proper analysis, still less for thoughtful choices, but they can powerfully assist both.

2.3 Introduction of ICT in Kenyan schools

Whichever level of the school System is considered, African countries, no matter what their geographical situation, have encountered similar problems; these can be analyzed under two headings; the economical and the socio-cultural aspects. The economic aspects are; lack of developed human resources; the brain drain, because of the poor environment; poor pay; computer scientist are not teacher oriented; Scarcity of computer Science courses; and lack of financial resources. For the socio-cultural aspects; the software is not adapted to the African Social context because it is designed abroad and therefore does not take into account indigenous thinking, belief and feelings (Hebenstreit, 1992; 196).

In Kenya the MOEST decided in 1982 to allow small experiments in computer education, both to gain experience and to produce computer literate students. Then in 1987 the MOEST, curriculum for post-secondary diploma studies in computer Science recorded its view that computer Science should not be an examination subject at least in the short term. In 1988, Kenyan Schools had about 230 microcomputers of which 140 were privately – funded schools (Hawkridge, 1990). Most of these computers were due to Computers in Education Project of the Aga Khan Education Service (CEPAK).

Computers are still expensive for developing countries and one might argue that instead of acquiring computers, these countries should built more schools, acquire more text books, set up a family planning policy to control population growth, invest more in the rural areas to promote self sufficiency, find a way to release women from their daily workload to favour their enrolment in schools, increase women participation in the development process and plan for the eradication of illiteracy.

Even though Kenya is a developing Nation, objectives can be achieved if the political will exists. In any kind of activity priorities have to be established within a school. If we want to develop the human resources through education, which is a factor of sustainable economic and social development, then maximum effort should be put in improving educational administration in Schools by integrating ICT.

2.4 Challenges linked to the integration of ICTs in schools

In industrialized countries, the obstacles linked to integration of ICTs fall within three categories: equipment, software and technical support. The increased investment in these three areas would enable the fostering of integration of ICTs in education (Karseti, 2006). The international scientific literature quoted in Karseti (2006), has highlighted eleven main problems linked to the pedagogical integration of ICTs, but three are worth mentioning with relation to management purposes, these are; technical difficulties, absence or lack of technical support at the time of ICT integration, absence or lack of support, training skills, problems linked to constraints and organizational obstacles of system or school establishment.

In Africa, many reasons could explain the lack of success in the use of ICTs in some school environments. These include lack of financial means, the insufficient number of computers, the lack of ICT-skilled teachers, and the absence of appropriate programs for the integration of ICTs in education. Other studies show that the problems that prevent school establishments from equipping themselves with computers, in order of decreasing importance: the absence of electricity, lack of funds, insufficient welcoming capacity, lack of qualified personnel and insecurity (Karseti, 2006).

Many authors also mention lack of tools, inoperative logistics, lack of or defective technological infrastructure such as shortage of telephone lines, indigent communications network, disparate, inadequate and obsolete, fluctuations in power surges, recurrent power shortages and failures, and the poor states of the roads (see Karseti, 2006).

Kozma identified a number of factors that are important and influential in implementing the intensive use of ICT, these factors are: vision on other innovations, leadership style of head teachers, integration of ICT in the school culture, teachers professional development, teacher collaboration and external policies and linkages relevant for ICT use and pedagogical change (<http://www.elfe.eu.net/flx/english/schools>). The European e-learning Forum for Education commissioned a study to find good experiences of pedagogical use of ICT and to identify good practices in using ICT it was identified that policies provided direction of the ICT related developments in schools but were also facilitating these in various ways including provision of finances, equipment, support and/ or staff development programs.

James (2001), points out that even in south Africa, which seems to be ahead of the other African countries less than 5% of school establishments equipped with computers plan budgets to train teachers in the use of ICTs, when we know essence in guaranteeing the durability of the use of ICTs. Furthermore budgets allocated to school establishment do not cover ICTs. Budgets for equipment and functioning of ICTs generally come from tuition fees, fundraising operations, gifts from NGOs and national and international partners (Karseti 2006).

2.5 School management system

A school management system (SMS) allows users to store almost all of their school's information electronically. Most important this information can be easily shared with authorized users, records can be easily searched, and reports can be easily generated pertaining to school activities.

Nowadays, the database is the only professional structure for storing and elaborating complex information and a huge amount of data. The database structure brings about several advantages, like: quick and real time access, high security, standards establishment, automated reports and statistics. It is the most popular format that businesses, banks, government, universities, schools and many other institutions all over the world are using for storing data and information concerning their activities (Brumbulli et al, 2008).

Many schools in the world have already installed their information management systems and are efficiently using advantages of information technology. A SMS is a large database system which can be used for managing your schools day to day business. SMS is configurable and can be configured to meet most individual school's needs. It is a multi-user system and can be used by hundreds or even thousands users at the same time. Generally speaking, it is a platform running on a Local Area Network (LAN) (Brumbilli et al, 2008).

Presently a SMS is the most appropriate method for managing information in a school setting just like many other organizations. By using SMS, finding information is just a few seconds away, which might have taken hours or even days before.

2.5.1 IT and School Management

There is need to examine information Technology in Educational Management (ITEM) and how it evolved around the world. The department of information systems in Education at the Israel Ministry of Education organized a conference on ITEM in 1995. While from that conference it can be concluded that many countries in the world by then were far much ahead in the use of ITEM. A paper on the international state of the art of Computer –Assisted School Administration and management (CASA) was presented.

Table 2.1 Time-frame for each stage of CASA development in seven countries (based on 1991 data).

	Initiation	expansion	integration
Hong Kong	end 1970s	early 80s	not yet
Australia	early80s	mid 80s	`85
Great Britain	`78	83	83
Israel	till `85	85	not yet
U.S.A	end 60s	`70s	80s
Netherlands	mid 70s	end 70s	85
Mexico	`58 -70	70s	not yet

Source (Barta,B. et al, 1995; 16)

As can be seen from the above table most of the countries had integrated CASA by 1985, this is the time Kenya was contemplating of introducing it as a course. And yet 24 years have passed with very little having been done to integrate ICT in secondary schools using CASA.

To the best of my knowledge, the issue of IT assimilation into school administration and management has not received the attention it deserves in Kenya. IT assimilation constitutes big

challenge for schools in Kenya especially those in rural areas. Much has been written about statistical process controls and productivity in manufacturing facilities but to date not much has been done or has been written about information systems impacting productivity in education settings (Barta et al, 1995).

Kidombo (2008), in a research carried out, the results obtained regarding the Kenyan situation showed that the integration of ICT in curriculum delivery is influenced by the ownership of the school, its ICT policy and the school managers level of ICT skills. While private schools seem to have a clear policy on ICT integration public schools have none. According to Kidombo, secondary school head teachers should have ICT skills because they can act as change agents by encouraging and driving the adoption of ICT in teaching learning processes in schools.

2.5.2 Available applications and their use

This is difficult to judge accurately which applications have been realized, since the names of the applications in fact only tell us that software has been developed that provides support with activities in certain areas (e.g. finance, personnel, time tabling). What specific activities are supported and how this is done remains obscure (Barta et al, 1995; 17). The number of secondary schools that do not use administrative applications either is still considerable; student data and word processing applications are found in the majority of secondary schools, but for almost all of the other applications 50% to 80% of the schools do not use them at all (Barta et al, 1995; 17).

2.5.3 Factors determining system use and impact

The figure 2.1 shows a model for the implementation of Computer assisted School information systems.

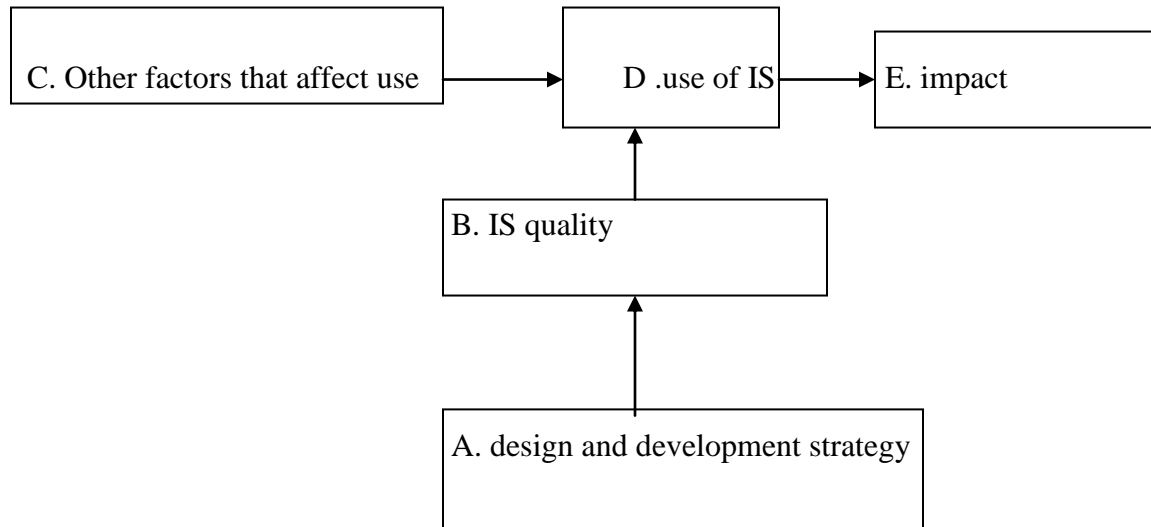


Figure 2.1: The relations between design use and effects of IS.

Source: Barta, B. et al 1995; 18.

The degree and way of use of the information system (IS) is supposed to be determined by information system quality characteristics (which are expected to be influenced by the chosen design strategy) as well as by other factors like the nature of the implementation process and of the school organization in which IS is implemented. The introduction of SISs has made it clear that the training of users is essential and that this usually receives far too little attention. Training often proves to be too technical, or else it does not focus on how the system is intended to support users in their various management responsibilities (Barta et al, 1995; 22).

Schools need more training to develop their computers assisted policy making capacity. Schools that want to use the computer for this purpose need to be able to: Decide which information they need for decision making and would therefore like to retrieve from the system, retrieve data by

means of a menu or a query language, interpret retrieved data in such a way that the resulting information can be used for decision making, use the information to develop, implement and evaluate school policy.

2.5.4 The Computer as Decision Making Tool in School Management

The computer enables the collection and processing of all relevant data in a 'real time' fashion, thus enabling the continuous screening of the activities of all parties involved: staff, students and management. All problems whether with the staff, the learning materials, or the students, are instantly identified and corrective measures taken promptly. In this manner, the quality of management is greatly enhanced and school climate is upgraded (Barta et al, 1995; 220).

The Computer-Assisted School Information System Framework

Administration subsystems

- student administration
- personnel administration
- financial administration
- timetable administration
- general school administration
- test administration
- resources administration

Management subsystems

- capacity planning
- educational planning
- financial planning
- school year evaluation

If the database becomes more flexible and relational, the enormous variety of interrelationships between data can be analyzed to support school managers. This however, requires training in order for the school managers to be capable to “exploit the wealth of information schools possess with modern, computerized school information systems” (Maki, 2008).

2.6 Government of Kenya ICT policies

2.6.1 The Central Government

Jones & Kozma as quoted in Hennessy et al (2010), national ICT policies can serve several important functions. Firstly, ICT policies provide a rationale, a set of goals, and a vision of how education system work if ICT is introduced into teaching and learning, and they can benefit students, teachers, parents and the general population of a given country.

According to Nduati & Bowman, quoted in Hennessy et al (2010), the earliest attempt at ICT policy formulation in Kenya dates back to the 1980s, but the process remained incomplete by 2000. After several years of effort, Kenya promulgated a national ICT policy in January 2006 that aims to “improve the livelihoods of Kenyans’ by ensuring the availability of accessible, efficient, reliable and affordable ICT services”. The national policy has several sections, including information technology, broadcasting, telecommunications and postal services. However, it is the section on information technology that sets out the objectives and strategies pertaining to ICT and education. The relevant objective in this section states that the government will encourage “..... the use of ICT in schools, colleges, universities and other educational institutions in the country so as to improve the quality of teaching and learning” (Farrell, 2007).

2.6.2 ICT in the Education Sector

In 2005 the Kenya Education Sector Support programme (KESSP) put down a proposed investment programme for ICT in education , development of E-Learning delivery systems, building of necessary capacity, development of required ICT infrastructure and institutional management systems. E-Learning delivery systems are intended to achieve increased access to education opportunities, increased access to learning materials, enhanced teaching/ delivery methods; increased sharing of learning materials and more affordable education. Management systems are intended to achieve efficiency and effectiveness on management of institutional data, information, decision making and administration as well as planning. Areas of considerable attention will include student records, accounts and financial management (Republic of Kenya KESSP draft, 2005).

According to Farrell, quoted in Hennessy (2010) asserts that while technicians can be employed to fix and maintain computers, teachers and educators must know how to exploit ICT for what it does best – opening learners up to the world of knowledge. Farrell also noted that investment into upgrading computer labs and building ICT capacity at the Teacher Training Colleges (TTCs) is an intervention which can quickly yield high returns. By providing adequate access to ICT, the TTCs can use it to achieve learning objectives at various levels.

2.6.3 Use of ICT in Kenyan Schools

The ministry's policy framework indicates that there are a number of challenges concerning access to and use of ICT in Kenya, including high levels of poverty, limited rural electrification, and frequent power disruptions. Most secondary schools have some computer equipment; however, this could consist of one computer in the office of the school head. Very few secondary schools have sufficient ICT tools for teachers and students. Even in schools that have computers,

student- computer ratio is 150:1. Most of the schools with ICT infrastructure have acquired it through initiatives supported by parents, the government, NGOs, the private sector, including the NEPAD e-schools programme (Farrel, 2007).

ICTs in Education Options Paper of June 2005 indicated that an assessment of the number of schools which already have computers and which are ICT-ready (e.g. infrastructure, connectivity availability, etc.) needs to be done to phase in ICTs to secondary schools across the country. According to most surveys, the majority of in-service teachers both at primary and secondary schools have minimal to no ICT literacy or integration skills; however, outreach to this community of teachers is very important in an overall ICTs strategy.

The governments' vision for education is quality Education and Training for Development with the overall goal of achieving Education for All (EFA) by 2015. Government of Kenya was committed to promoting and popularizing ICTs as well as science and technology education by 2008. The main interest of GOK regarding ICTs in education is to facilitate the use of education institutions as hubs of ICT dissemination in rural areas.

2.7 Investment of ICT in Kenya education sector

Investment in ICT in education reflects what has been recognized in the Kenya ICT policies. It recognizes the need for Public-Private partnership. An ICT unit has been established at the Ministry's head office (Hennessy et al, 2010). The government of Kenya, through the Ministry of Education, Science and Technology (MoEST) plays a coordinating, overseer and mobilization role in bringing together key stakeholders in the ICT in education sector (Farrell, 2007). A main component of this implementation strategy is achieved through the Kenya ICT Trust Fund.

Kenya ICT Trust Fund is a registered consortium in the form of an NGO in Kenya that brings together many partners from the public, private and civil society sectors. It is chaired by the Permanent Secretary of the Ministry of Education. Its main objective is to mobilize funds for the sole purpose of setting up computer laboratories in all Kenyan secondary schools in 4-5 years. Information on achievements of the fund so far was not readily available (the link to its website is non-functional). However, one of the partners – Microsoft Partners in Learning – reported having delivered a 5-day training course to over 500 secondary school teachers, and also helped organize and direct over \$80,000 worth of contributions from Trust Fund members, including donated computers. It must be noted here that coordination efforts should be widely publicized for intending partners to see what has been achieved and what remains. This is necessary for improving transparency to encourage future participation, sharing of experiences learnt and best practices and for minimizing likely duplication of efforts (Hennessy et al, 2010).

A number of initiatives have delivered ICT infrastructure to schools. These include initiatives supported by parents, the government, NGOs, or other development agencies and the private sector (Farrel, 2007). Notable among these are EMIS, Computers for schools – Kenya, NEPAD e-schools initiative, and the Microsoft Partners in Learning program (Hennessy et al 2010).

Summary of the literature reviewed

The computer has become a major aid in administration and management of schools. This achievement is the outcome of its capability in both storing and processing vast quantities of data, as well as in making complex decisions.

Raising the awareness in the use of computers for administration and management of schools can be accomplished easily. This will make principals take corrective measures at the right time hence enhancing efficiency.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the research design and location are outlined, the target population and the sampling procedure is given. The research instruments, piloting of the instruments to test the reliability and validity of the instruments in the study has also been given. The data collection technique which was used in the study is also given. Also the data analysis methods which were used at the end of the study are given.

3.2 Research Design and locale

The design selected for this study was ex-post-facto research. In this design the causes of behavior patterns in subjects under investigation are studied after they have exerted their effect on other variables.

According to Kerlinger the ex-post factor research is defined as a systematic, empirical inquiry in which the scientist does not have direct control of the independent variables because their manifestations have already occurred or because they are inherently not manipulable (Sic). The variables occur in the setting, usually a natural setting, and the researcher attempts to determine the relationship and effects that are occurring between the variables (Orodho, 2009; 51).

In this study the design is appropriate because the principals' knowledge in IT, their professional qualifications and their management experiences cannot be manipulated.

The location of the study was Nyamira district in Nyanza province, Kenya. The district has four divisions namely Nyamira, Nyamaiya, Ekerenyo, and Nyamusi. Farming is the major economical activity with tea as the main cash crop. The District is located in a rural setting

with 81 secondary schools and is densely populated. The target schools under study were located in places with weak infrastructure and limited facilities in terms of transportation and other means of communication.

3.3 Target Population and Sampling

The target population for this study consisted of all the principals of public Secondary schools with electricity in Nyamira district. Nyamira district has 80 public secondary schools and out of this 35 have electricity. The School principals are the managers of these Schools and hence need IT skills in order to effectively perform their numerous and complex management tasks.

The study sample comprised of 30 principals. Accordingly, purposive sampling was used to select the schools from which the principals were included in the study was drawn. In this form of sampling, the investigator relies on his/her expertise or expert judgment to select units that are representative or typical of the population (Orodho, 2009; 147). This is because the criterion used to select the subjects in the study was electricity supply in the schools.

3.4 Research Instruments

The purpose of a tool or instruments in research is to measure the variables of the study (Mugenda, 2008; 284). The researcher used questionnaires and observation for data collection. The questionnaire had both open ended and closed ended items.

3.4.1 Piloting of the instruments

After obtaining a research permit from the permanent secretary of Ministry of Education Science and Technology and an introductory letter from the university, the researcher conducted a pilot testing of the questionnaire in five Schools in the district. These Schools were not included in the main Study.

The reason for piloting was to ensure that measurements were of acceptable reliability and validity.

Reliability-of measurements concerns the degree to which a particular measuring procedure gives equivalent results over a number of repeated trials (Orodho, 2009; 182)

Validity- The degree to which test measures what it purports to be measuring (Orodho, 2009; 187).

The procedure used to measure reliability by the researcher was split – halves method.

3.5 Data collection Techniques

A letter of introduction was obtained from Kenyatta University. The researcher sought permission from the secretary National Council for Science and Technology (NCST) where a research permit was obtained. Consent to carry out the research in Nyamira district was obtained from the District Education Officer (D.E.O.) Nyamira District. The researcher visited the sampled schools and administered the questionnaires to the principals'; short notes of observations were also made during the visitations. The respondents were assured of confidentiality of the information they were to provide. The completed questionnaires were collected from the respondents as agreed upon.

3.6 Data Analysis

The data collected were edited by the researcher. He went through the questionnaires from the respondents and the field notes made by observation to check their completeness, accuracy and uniformity in the interpretation of the questions. The responses were tabulated, coded and processed manually. Patterns to the research questions were analyzed according to the items in the questionnaire. This data were then presented in the form of frequency tables and percentages.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

The purpose of this study was to examine the challenges facing principals in integrating ICT for efficient management of schools in Nyamira District in Kenya. This chapter focuses on analysis and discussion of the research findings of the study. In the study, 30 principals of schools with electricity were accessed. Questionnaires from the principals were checked for completeness and accuracy was determined as complete. 30 out of the 32 questionnaires were returned, this was 93.75%. The findings are discussed under the following objectives of the study:

1. ICT literacy levels of secondary school principals in Nyamira District.
2. Challenges encountered by principals in the integration ICT for management of secondary schools in Nyamira District.
3. Challenges faced by principals in the acquisition of computer software for management in Nyamira District.
4. Extent in which ICT is being used for management in Nyamira District.
5. Probable recommendations that will help principals use ICT for management.

4.2 Principal characteristics

The characteristics of the principals were sought which included; gender, experience in teaching profession, academic qualifications, experience as principals and the length of stay in their present stations. The characteristics of the schools headed by the principals were also established so as to find out any patterns or relationships with the challenges facing them in integrating ICT for management. After looking for any patterns in the findings a few constants emerged. Both male and female principals were having equal chances of having the innovation established in the schools. However, it was observed that 80% of the principals were male as opposed to 20%

females. This fact was attributed to having 20% of the schools being girl's schools and 80% were either boy's or mixed sex schools.

Table 4.1 Ages of the principals

Age	Number	Percentage
<30	0	0
30-39	4	13.33
40-49	23	76.67
>50	3	10

Table 4.1 shows that a high percentage of the principals in the study 23 (76.67%) were in the age range of 40-49 followed by 4 (13.33%) in the age range of 30-39 and 3 (10%) over 50 years. This indicates that the principals are in their prime age and capable of adapting innovations and technology changes.

4.3 Experience of the principals in the teaching profession and as principals

Table 4.2 Experience of the principals in the teaching profession

Years in teaching profession	Number	Percentage
<10	0	0
10-19	14	46.67
20-29	15	50
<30	1	3.33

Table 4.2 shows that out of 30 the principals in the study 15 (50%) had a teaching experience of between 20-29 years followed by 14 (46.67) with teaching experience of 10-19 years and 1 (3.33%) had a teaching experience of 10-29 years. This results show that the principals are experienced teachers.

Table 4.3 Experience as principals

Years	Number	Percentage
<5	9	30
5-10	13	43.33
10-20	8	26.67
>20	0	0

Table 4.3 shows the experience of the principals in the study. It indicates that out of the 30 principals 13 (43.33%) had an experience of between 5-10 years; 9 (30%) had less than 5 years. and 8 (26.67%) had experience of 10- 20 years as principals. From the results it can be seen that a high percentage of the principals were highly experienced as principals.

4.4 Academic qualification

Table 4.4 Academic qualifications of the principals

Qualifications	number	Percentage
M.Ed	2	6.67
M.A	3	10
B.Ed	23	76.67
BA/BSc with PGDE	1	3.33
Others	1	3.33

Table 4.4 shows that 25 (83.33%) had a first degree whereas 5 (16.67%) had obtained their second degree. From these findings it means that a high number of the principals are not having advanced degrees which can help them acquire skills in new management skills.

4.5 Number of years for the principals in their present stations

Table 4.5 Number of years for the principals in their present stations

Years	Number	Percentage
<5	14	46.67
5-10	9	30
10-20	7	23.33

Table 4.5 shows that 14 (46.67%) of the principals had stayed in their present station for less than 5 years; 9 (30%) for between 5-10 years and 7 (23.33%) for between 10-20 years. This

could be an impediment to setting up an ICT infrastructure due to the short time that a high percentage of the principals have spent in those schools.

4.6 School enrolments

Table 4.6 School enrolment

Enrolment	Number	Percentage
<200	5	16.67
200-400	17	56.67
400-600	6	20
600-800	0	0
>800	2	6.67

Table 4.6 shows that 17 (56.67%) of the schools in the study had a student population of 200-400; 6 (20%) had a student population of 400-600; 5 (16.67) had a student population of less than 200 students and 2 (6.67%) had a student population of over 800 students. With this high student population the more reason it is imperative that management in these schools needs ICT.

4.7 ICT literacy levels of the principals

The computer literacy and levels of literacy of the principals in the study was sought and the tables 4.7 and 4.8 show the findings respectively.

Table 4.7 Computer literacy of the principals

Literate	Number	Percentage
Yes	23	76.67
No	7	23.33

Table 4.7 shows that 23 (76.67%) were computer literate and 7 (23.33%) were not literate.

However, those who had no knowledge of computers indicated that they will acquire computer operation skills soon.

Table 4.8 Level of computer literacy

Level	Number	Percentage
Degree	0	0
Diploma	1	4.35
Certificate	7	30.43
Self knowledge	15	65.22
Total	23	100

Table 4.8 shows the level of computer literacy of those who indicated that they were able to use a computer and results show that 15 (65.22%) had self knowledge; 7 (30.43%) had attended a certificate course and only 1 (4.35%) had attended a diploma course. From this findings, it shows that most principals had learned how to use computers on their own and had not attended courses which could enhance their knowledge of computers. The basic knowledge obtained is not substantial for high ICT skills which can be used for management purposes for example using a spread sheet package and using a data base. In a study on ICT use for school administrative and instructional use, Pelgrum and Plomp (1993) found out that there was a relationship between what was learnt in ICT during training and the extent of use of ICT for instructional and administrative purposes by teachers and administrators, thus making training a crucial component in ICT use in schools. Lack of computer training for teachers and administrators in the schools proved to be a major drawback. In a study to find out challenges of using ICT in school administration in Kenya, Menjo and Boit (2005) found out that the lack of appropriate training among the respondents led to the low use of ICT for administrative purposes save only for word processing.

Gakuu (2009) asserts that the Kenya Technical Teachers Training College (KTTC) has ICT in the teacher training curriculum; however there are challenges involved which include lack of enough computers; technophobia and unreliable internet connectivity. Therefore, if other teacher training institutions can include ICT training in their curriculum, it will go a long way in alleviating the problem of pre-training. Further, the ICT skills of the school manager were seen to be a major factor due to the trickle-down effect which was observed. The training of teachers in ICT had been consistent in the schools where the principal had ICT skills or had a keen interest.

In some of the schools teachers were being in-serviced and at the same time were expected to produce computerized work as a matter of policy.

4.8 Number of computers in the schools and how they were acquired

4.8.1 Number of computers in the schools

Table 4.9 Number of computers in the schools

Number of computers	Number of schools	Percentage
0	5	16.67
1-5	9	30
6-10	8	26
11-20	3	10
21-30	4	13.33
>30	1	3.33
Total	30	100

Table 4.9 shows that most schools have enough computers which could be used for management purposes however observation revealed that they are being used for teaching computer studies. In only one school in the study it was observed that the ministry had given computers to be used for e-learning, however it was noted that the program is far from being implemented.

4.8.2 Acquisition of computers

In most of the schools where the study was conducted the computers were purchased by using funds given by the government for free day secondary education. In some of the schools the funds were obtained from BOG, PTA and contributions from the parents. In other schools they were donations from various sources such as VIAFRICA, anonymous donors, computer for

schools Kenya. And yet in others they were those meant for SMASSE training in the District centers. Only 2 (8.7%) of the schools with computers had obtained from the MOE and in one of this schools they were meant for e-learning which had not been implemented yet. This agrees with a study in Nandi North district in Kenya where 60% of the schools had been beneficiaries of computer donations from well wishers, either foreign or from within while other schools had used their own funds to purchase the hardware, software and personnel (Menjo and Boit 2005). This study is also in agreement with a study done by Gakuu (2009) where the findings indicated that ICT in Kenyan schools is largely internally driven. The initiative emanate from the school management, BOGs, PTAs and the learners themselves.

4.8.3 Types of Software used

In 21 (84%) of the schools in this study the only software which was being used was Microsoft office package for general purposes. Only 4 (16%) of the schools had a semblance of a school management system obtained from programmers by using school funds to purchase it. The number of secondary schools that do not use administrative applications either is still considerable; student data and word processing applications are found in a majority of secondary schools (Barta et al, 1995; 17)

4.9 ICT management uses

From the study it was apparent that the use of ICT was for typesetting and printing of examinations. Other uses were for clerical purposes such as word processing to a limited extent. The use of ICT for budgeting, keeping of inventory, preparation of the timetable and use in the library had not been tapped fully. This can be attributed to the low levels of computer literacy, lack of available computer software in the market and lack of finances for purchasing both software and hardware. From these findings it can be concluded that most of the work in the

schools has been left to the teachers giving them little time to do other duties which do not require ICT use. This agrees with a study by Menjo and Boit (2005), in the study ICT use was most pronounced for word processing. This is evident from the results of table 4.5.

Table 4.10 ICT management uses

Task	Number of schools	Percentage
Typing of exams and printing	19	63.33
Administration records	12	40
Examination analysis	11	36.67
Student fees records	9	30
Preparation of report cards	8	26.67
Student information/enrolment	5	16.67
Budgeting and processing of finance records	4	13.33
Library	2	6.67
Keeping of inventory	0	0
Preparation of timetable	0	0

4.10 Internet connection

In the schools under study none of the schools had internet connection. Few schools however indicated that they had bought modems from various mobile companies which they used in registering candidates this year. There was no indication of them being used for any other purposes. Reason given for non-connectivity of internet was not only the cost of internet services but also the low level of development especially of communication infrastructure in the entire

nation. This is because schools in rural areas do not have electricity and the cost of internet has been very high (Ayere et al, 2010). Ongeru, quoted in Ayere (2010), hopes this will come down drastically with the completion of the first undersea cable.

4.11 Recommendations in the use of ICT for school management

The principals who took part in the study gave many recommendations on how ICT use could be enhanced for management. However, it is worth noting that many of the recommendations are contained in many government documents such as Sessional paper No.1 of 2005, ICT Options paper of 2005 and KESSP Draft of 2005.

The recommendations given by the principals included, the government through the MOE to provide computer to the schools, the government to intensify rural electrification such that each school is connected to the grid. Other recommendations are the government to set up policies on how to retrain teachers in the use of ICTs, and through the MOE to provide IT technicians to support maintenance and management of hardware and software. There should be integration of ICT learning in teacher training colleges; also the internet should be made affordable for the schools. In addition, the MOE to put mechanism in place for the installation of intranets and extranets to connect schools and MOE within the regions and the headquarters. They also recommended for introduction of e-learning in secondary schools.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter focuses on the summary of the study findings, conclusions made from the findings and recommendations for further studies.

5.2 Summary

The purpose of the study was to investigate challenges facing principals in integrating ICT for efficient management in secondary schools in Nyamira District, Kenya. The ex-post-facto research design was employed and provided the basis for data collection, analysis and presentation. Research questionnaires for the respondents and observation schedule were used for data collection from the principals and the schools.

The following is a summary of the major findings of the study.

The study revealed that personal factors such as age and gender did not appear to play any role in influencing the use of ICT for management purposes. In the study, 23 (76.67%) had a first degree and only 5 (16.67%) had obtained a second degree; this could have a bearing in the level of management skills that the principals have.

Enrolment in the schools was low where it was found that 22 (73.34%) had less than 400 students which could be a major reason for not having funds to put up an ICT infrastructure. Though 23 (76.67%) of the respondents were computer literate 15 (65.22%) had self knowledge on the usage of computers. Lack of training usually is significant in the use of innovations. 29 (96.67%) of the schools in the study had less than 30 computers in their schools including 5 (16.67%) schools who did not have any computer. The computers were being used mainly for teaching of computer studies.

The government has not played any significant role in introducing ICT in the schools. Only 2 (8.7%) of the schools in the study had obtained computers from MOE. The rest had obtained them from school funds and few schools were beneficiaries of well wishers. Only 4 (16%) had acquired school management systems. ICT management uses were limited, mainly for clerical purposes and the processing of examinations.

5.3 Conclusions

A number of conclusions were arrived at regarding the challenges facing the principals in integrating ICT in secondary school management. At the policy level, the MOE had not come up with a clear ICT policy, nor had it encouraged secondary schools to come up with a policy to support ICT use in management. Due to this secondary schools have acquired computers haphazardly with lack of proper strategy on their use.

On computer purchases, schools were not giving priority in their annual budgets hence the few computers being used in the schools. The scarcity of hardware and software for schools were some of the hindrances in the use of ICT for management in the schools. The study revealed that a high proportion of the principals lacked training in ICT skills required for management thus leading to minimal use of computers.

The study further revealed that ICT use was mainly for clerical activities and to a lesser extent, other management duties, most specifically the processing of examinations. This means that the computers have only taken the role initially played by the typewriter.

The capability of ICT in timetabling, financial management, inventory taking and decision making was very low and hence schools need to take a proactive process of tapping the power of ICT to manage this schools.

However, it was revealed in the study that there was a positive attitude by the principals towards ICT use to a small scale, though they were hindered by lack of financial support. It was also revealed that there were a number of players who are trying to support the acquisition of the infrastructure required for the installation of ICT. It is worth noting that despite the lack of finances, there was a realization that ICT is an innovation which can be used for management so that there can be more free time to be used by school personnel in other duties which can make education effective and efficient hence high performance.

5.4 Recommendations

From the findings of the study it became clear that certain factors are required for the schools to realize intensive use of ICT for management and hence the following recommendations, this include;

- The schools should have a clear vision when they have implemented ICT infrastructure for management purposes.
- The principals or school leadership should support and monitor the process of change using the innovations in ICT.
- The government should ensure that secondary schools are supplied with electricity.

- The schools should have policies put in place on school staff development both the teaching and non teaching staff.
- The government should support the use of ICT in school management and provide the schools with financial means and equipment.
- The parents and local communities should be involved in supporting developments in ICT infrastructure in schools.

5.5 Recommendations for further research

As a consequence of this study the following are a number of areas which were considered important for further investigation;

1. The applicability of findings generated from researches in secondary schools should also be extended to include primary schools.
2. There is need for an in depth study to evaluate the use of ICT for management in secondary school in Kenya.
3. An assessment of the quality and skill levels of the senior management staff in secondary schools in the use of ICTs.

REFERENCES

- Ayere, M.A., Odera F.Y. and Agak, J. (2010). "A Comparison of Information and Communication Technology Application in New Partnership for Africa's Development (NEPAD) and Non-NEPAD Schools in Kenya", in Journal of Information Technology Education Volume 9, 2010.
- Barta, B., Moshe T. and Gev, Y. (1995). Information Technology in Educational Management. London: Chapman & Hall.
- Brook, K. and Anderson, K. (1989), Educational Administration; Longman group UK LTD.
- Brooks-Young, S. (2006). Critical Technology, Issues for School Leaders, Corwin Press, USA.
- Brumbulli, M., Topciu, B. and Dalacia, (2008). SMIS: A Web-Based School Management Information System (International Scientific Conference Computer Science '2008)
- Evoh, C.J.(2007). International Journal of Education and Development Using Information and Communication Technology (IJEDICT), Vol.3, Issue 1, pp.64-84.
- Farrel, G. (2007). Survey of ICT and Education in Africa: Kenya Country Report. ICT in Education in Kenya. www.infodev.org
- Gakuu M.C., Kidombo H.J., Omondi B., Ndiritu A., Mwangi A., and Gikonyo N., (2009). Kenya Pan African Report. The Panafrican Research Agenda on Pedagogical Integration of ICTs.
- Hawkrige, D., Jaworski J. and McMahon, H. (1990). Computers in Third World Schools; Examples, Experiences, and Issues. London: The Macmillan Press LTD.
- Hennessy S., Onguko B., Harrison D., Ongondi E.K., and Wamakote L., (2010). Developing the Use of Information and Communication Technology to Enhance Teaching and Learning in East African Schools. Review of Literature in Research Report No.1.
- Hebenstreit j., Levrat B., Bork A., et al (1992). Education and Informatics Worldwide; The State of the Art and Beyond. Jessica Kingsley Publishers/ UNESCO Paris 1992-UNESCO.
- <http://www.teachingexpertise.com/article/asset-management-secondary-schools-3927>
- James, T. (2001). An information policy handbook for Southern Africa. IDRC.
- Karseti, T. (2006). Panafrican Research Agenda on Pedagogical Uses of ICTs. IDRC.
- Kidombo, H. (2008). <http://www.uonbi.ac.ke/departments/staff-prc>
- Maki, C. (2008). Information and Communication Technology for Administration and management for Secondary Schools in Cyprus. www.pliroforiki.org/joomla/index.php?option=com_docman
- Menjo, D.K., and Boit, J.M. (2005). The Challenges of Using Information Communication Technology (ICT) in School Administration in Kenya.
- Mugenda, A. (2008). Social Science Research; Theory and Principles. Nairobi: Kijabe Printing Press.
- Muhammad Z. (1997). Computer Assisted School Administration (CASA): Factors Crucial for the Success of its Implementation at Fully Residential Schools in Kedah Daral Aman.
- National Economic and Social Council of Kenya (NESC), 2007. Kenya Vision 2030. http://www.investmentkenya.com/Documents/Publications/Vision_2030_BROCHURE%20July%202007.pdf
- OECD (2004). OECD Information Technology Outlook 2004. Paris.

- Oloo L.M. (2009). Baseline Survey Report for ICT in Secondary Schools in Selected Parts of Kenya. Draft Report.
- Orodho, J., (2009). Elements of Education and Social Science Research Methods .Maseno: Happyland Enterprises.
- Owen, j. (1992). Managing Education: The Purpose and Practice of Good Management in Schools. London: Longman.
- Passey D., (2002). ICT and School Management A Review of Selected Literature.
<http://www.becta.org.uk/research/reports/ictresources.html>
- Pelgrum W. J. & Law N. (2003). ICT in education around the world: trends, problems and prospects. Paris UNESCO: international Institute for Educational Planning.
<http://www.unesco.org/iiep> downloaded on 30/09/2010
- Pelgrum W. J. and Plomp (eds), 1993. The IEA Study of Computers in Education: Implementation of an Innovation in 21 Education Systems, London: Pergamon Press.
- Republic of India Department of School Education and Literacy Ministry of Human Resource Development Government of India (2009). National Policy on information and Communication Technology (ICT) in School Education.
<http://education.nic.in/secedu/ict.pdf> downloaded on 29/01/2011
- Republic of Kenya, Ministry of Information and Communications (January,2006). *National Information and Communication Technology (ICT) Policy*.
- Republic of Kenya, Ministry of Education Science and Technology (June, 2005). Government ICT in Education Option Paper.
- Republic of Kenya, Ministry of Education Science and Technology (2005), Kenya Education Sector Support Programme 2005-2010
- Sarah,R. and Trafford, V. (1990). Research in Education Management and Policy: Retrospect and Prospect. London: The Falmer Press.
<http://www.au.org/mrci/projects/ict.pdf>
- World Bank (2005). Expanding Opportunities and Building Competencies for Young People: a New Agenda for Secondary Education. Washington DC: the World Bank.
- World Bank (2008). Governance, Management, and Accountability in Secondary Education in Sub-Saharan Africa. World Bank Working Paper No.127. Washington D.C.: the World Bank.
- World Bank (2011). Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education. Downloaded on 7/9/2011 from
<http://go.worldbank.org/HTKE9NIKFO>
- Visscher A.J. (1996). Information Technology in Educational Management as an Emerging Discipline. Elsevier science Ltd.

Appendix 1

Questionnaire

Questionnaire for Principals in Nyamira District on the use and impact of ICT on management of public secondary schools.

Instructions

This questionnaire has been designed to gather information about the use and impact of ICT in the management of secondary schools in Nyamira District. You are assured that the information you will give will be treated confidentially. You are kindly requested to respond to all questions.

Part A: General information

Use tick

1. Gender Male Female

2. Age below 30 years

30-39 years

40-49 years

Above 50 years

1. Indicate no of years in the teaching profession

Less than 10 years

Between 10-19 years

Between 20-29 years

Above 30 years

2. Highest academic qualifications

M.Ed

- M.A
- B.Ed
- BA/BSc with PGDE
- Others (specify)
3. Experience as principal
- Less than 5 years
- Between 5-10 years
- Between 10-20 years
- Over 20 years
4. Number of years in present station
- Less than 5 years
- Between 5-10 years
- Between 10-20 years
- Over 20 years
5. Enrolment in your school
- Under 200
- Between 200-400
- Between 400-600
- Between 600-800
- Above 800
6. Type of school
- Day
- Boarding
- Day and boarding
7. Are you computer literate?

- Yes
- No
8. If yes, level of computer literacy
- Degree
- Diploma
- Certificate
- Self knowledge
- 11 .If No, when do you intend to acquire computer training?
- Soon
- Later
- Never
12. Do you have a computer in your office?
- Yes
- No
13. If yes, are you using it for management purposes?
- Yes
- No

Part B

14. a) How many computers do you have in the school _____
- b) How many of this are functional _____
- i) How many are used for management _____
- ii) How many are used for curriculum instructions _____
- c) Briefly explain how you obtained them.

- d) Name the departments using them for management
- i) _____
- ii) _____
- iii) _____
- iv) _____

Appendix 2

Time schedule

September –December 2010-----Proposal writing

January-April 2011-----presentation of proposal to the
Department and defense

May 2011 -----Actual research

June 2011 -----Analysis of research findings

July 2011 -----Writing of the project