

**AN ASSESSMENT OF PUBLIC PRIMARY SCHOOLS PREPAREDNESS FOR
THE IMPLEMENTATION OF E – LEARNING PROGRAMMES IN
EMUHAYA SUBCOUNTY KENYA**

BY

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DECLARATION

Declaration by Candidate

I declare that this thesis is my original work and has not been submitted in any other university for the award of a degree or diploma.

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ABSTRACT

The purpose of this study was to assess the preparedness of public primary schools for the implementation of e – learning programmes in Emuhaya Subcounty in Kenya. Four specific objectives guided this study as follows: To establish the physical structures available to facilitate e – learning, quantities of electronic hardware and software available in schools, teacher preparedness in terms of knowledge and skills and the challenges which implementers were likely to face. The study employed an ex-post facto design with Critical Success Factors (CSFs) theory designed by Freund (1998). The target population of the study was 664 class teachers from 83 public primary schools, each school providing eight teachers. Simple random sampling method was used to select 25 public primary schools from 83 schools in the subcounty. The sample size comprised 200 class teachers as respondents selected from middle and upper primary classes. Questionnaires were administered to class teachers and their responses presented in frequencies and percentages for the purpose of data analysis. Pilot study was carried out in two schools. Chi-Square(x^2) was used to test relationships between variables while Spearman’s rank correlation was employed to test the null hypothesis. The findings of the study revealed that 95% of public primary schools did not have computers and 79% had no electricity. The results of the study also revealed that 73% of teachers in public primary schools had not handled an e – learning lesson. The study recommends that implementation of e – learning programmes requires adequate provision of teaching and learning resources. Teachers’ engagement with materials from the internet needs the competency on how to use the new technologies effectively in the classroom for the benefit of the learners. Since e – learning is uniformly standardized, it is important to note that implementation of the innovation would eliminate excessive reliance on traditional methods of instruction. A paradigm shift in education would be created focused on integrated instructional approaches. This study would be found useful to policy makers and primary school teachers.

DEDICATION

This work is dedicated to my wife Joyce Asiko and my sons Gideon Sichenga, Clinton Makhuka and Byrum Silvanus for their support accorded to me during the period I undertook this study. I also wish to recognize my sister in-law Milka and my brother Caleb for the support they accorded me. To my beloved parents Joan and William Opati, I am also indebted to them for their support and realization of my studies. May God bless them all.

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ABBREVIATIONS

CCK	Communications Commission of Kenya
CDET	Collaborative Development E – learning Technologies
CDF	Constituency Development Fund
CSFs.....	Critical Success Factors
CPF.....	Computer Practice Framework
EFA	Education for All
ICT	Information, Communication and Technology
KICD	Kenya Institute of Curriculum Development
MOEST	Ministry of Education Science and Technology
NEPAD	New Partnership for Africa’s Development
SEM.....	Structure Equation Model
TEAMS.....	The East African Marine Systems
UNESCO	United Nations Education, Scientific and Cultural Organization

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.0 Introduction

The chapter covers the background information in regard to the contribution of ICT technology to the economies of many nations and why it should be integrated into the Kenyan education system. It provides information on statement of the problem, the purpose of the study, objectives, research questions, research hypothesis, significance of the study, justification, scope of the study, limitations and assumptions of the study, theoretical and conceptual framework.

1.1 Background Information

The use of ICT in many countries has contributed to improvement of their economies through scientific knowledge and services. Youths in these countries have access to employment opportunities. In Kenya the policy makers initiated Vision 2030 as a vehicle for industrial advancement and growth of economy. This is a very important step undertaken by the government to prepare the country for future development. Jackson (2004) argues that the advancement of countries lies in global reform and development of education through ICT technology.

The business activities experienced in Kenya today are an indication that information technology has opened the doors of employment to young people, for example, through electronic funds transfer and information services using computers. Within this context a strong advocacy is made for primary schools to equip young people with ICT knowledge and skills as a foundation in their education. MOE (2006) report says that

the government has very clear mission on ICT policy. It was published through Kenya Government Gazette notice No. 24 in March 2006 as 'Prosperous ICT-driven Kenyan Society', which puts ICT in the centre of national development.

It was developed to support what MOEST (2005) spelt out in Sessional Paper 5 of 2004 on policy framework for education, training and research whose vision is 'Quality education and training for development'. The purpose is to integrate ICT into education and training systems.

Public primary schools in Emuhaya have large enrolments and staffing is an issue because teachers are not enough. The solution to this problem lies in the introduction of e – learning in schools as one teacher can deal with more learners within a specific period of time. Therefore, schools require preparing in terms of physical facilities, equipment and human resources for the purpose of successful implementation of e – learning programmes. Kim (2002) argues that the preparedness lies within the provision of quality learning resources and facilities. The expanding knowledge has put immense pressure on learning facilities and effective professional practice in primary schools. The increasing explosion of information and technology need flexible learning and teaching approaches to meet the challenges of 21st century. There is need for ICT trained teachers and maximum utilization of learning resources.

Public primary schools are expected to be prepared for implementation of e – learning programmes because learners learn better if they are accorded autonomy in the classroom. With time and facilities they could construct knowledge for themselves and others. There are various technologies available in the classroom for teaching and learning. The technologies include blackboards, whiteboard, computers, video and

recorders among others. Teachers require technological pedagogical knowledge and content to effectively facilitate learning in the classroom. As they apply the content teachers require understanding of the backgrounds of the learners. It helps them know their weaknesses and see how best they could deal with each case.

Mbando (2003) argues that teachers require competency in ICT to be able to benefit the learners. Delivery of e – learning education in primary schools is important because with the use of internet it would bring new ideas and information meant to educate, mould and shape young people in the society. Application of electronic media would mechanize the process of teaching. In view of this Santhanan (1992) argues that mechanized instruction can help teachers to deal with more learners with less expenditure educating them. Individual development would be harmonized with aesthetic education and works of art in an effective instruction. Mukwa (2000) argues that televised instruction makes effectively improves access to schooling for rural and urban groups of learners. It saves on time and ensures that the syllabus is fully covered. It is also important in distance learning and dissolves the barriers of both distance and time to access schooling.

One of the most versatile technologies in the modern classroom is the computer and related digital systems, the internet. The presence of ICT in a school is a pointer to an enabling environment for e – learning. It is prepared in order to provide access to quality education, equality and equity through teleconferencing. It is expected to help with addressing perennial problem of teachers’ shortage. As much as that can be planned it is also important to note that new changes in the curriculum cannot easily be implemented focusing on challenges that are likely to come with the system. Teachers’ attitudes have a profound impact on teaching practices and behaviours of learners.

Goldhaber (2003) says that attitudes provide meaningful learning experiences and would support learners getting well prepared for e - learning. So, it is important to sensitize teachers, for example, in seminars and workshops to be fully engaged in ICT teaching. Mbando (2003) argues that to be effective teachers require the competency to use all technologies in the classroom for the benefit of learners.

1.2 The statement of the problem

After studies were carried out in e – schools project, NEPAD (2003) report recommended that ICT delivery of education be integrated in primary schools. It was followed by MOEST (2005) report in the Kenya Government Sessional Paper No. 1 of 2005 which laid emphasis on ICT skills to provide economic development in the country. Since then public primary schools have not been seen carrying out the process of implementation. It prompted the need to carry out an assessment of public primary schools preparedness by looking at the availability of appropriate physical structures for e - learning, electronic equipment and human resources.

The expanding knowledge and continued demand for ICT education calls for important initiatives to be laid down first by each public primary school in Emuhaya Subcounty. Computer laboratories are required with adequate space to accommodate all the learners for a single e – learning lesson and other learning resources such as furniture. There is need to determine availability of security for cushioning schools against vandalism a practice that is prevalent in rural local communities. Mukwa (2000) argues that there is need to have flexible learning and teaching approaches incorporated in education through electronic multimedia.

Therefore, e – learning equipment in public primary schools need to be identified. ICT technology in education is an emerging issue and its exploitation as an instructional process requires effort in providing funds to buy equipment and sustaining the programmes. Complementary sources of financing the innovation should be sought because economic development of the country cannot be achieved without modern technology. Integration of electronic media resources into modern education is very important. Menjo (2008) asserts that the media should supplement and complement traditional classroom learning and teaching. The use of ICT and the internet is highly justifiable because it can be used as a catalyst to initiate changes in pedagogical practices.

The most critical element of an effective schooling for pupils is the quality of teachers. What teachers know and do have the most influence on what pupils learn. The quality of a teacher should be supported by formal training from ICT training colleges. Teachers require continuous training on emerging issues in education such as classroom management and curriculum implementation of e – learning. ICT integration in teaching and learning is an innovative and powerful method of instruction that requires professional development of the teachers. In support of above information Goldhaber (2003) asserts that the teacher's quality has the greatest impact on learners' achievement among educational resources.

Osei (2006) on professional development argues that consultative meetings give teachers the opportunity to interact and get new ways of assessing learners. Their positive attitude towards e – learning may stimulate learners' creativity and motivation.

Consultative meetings with other teachers in forums in regard to e – learning instruction should be encouraged to have a lasting impression on their attitudes and behaviours.

They would have high level of commitment to work which may increase their skills and content knowledge through sharing of information. Since this country is looking forward to realization of Vision 2030, implementation of ICT technology in primary schools would give this country a strong foundation. That is why study sought to assess the preparedness of public primary schools.

1.3 The purpose of the study

The purpose of this study was to assess the preparedness of public primary schools for the implementation of e – learning programmes in Emuhya Subcounty.

1.4 Specific objectives

The study was guided by the following objectives, to:

- 1) Assess the physical structures available to facilitate the use of e – learning in public primary schools in Emuhaya Subcounty.
- 2) Assess the quantities of electronic hardware and software available in public primary schools in Emuhaya Subcounty.
- 3) Assess the teacher preparedness in terms of knowledge, attitudes and skills for presentation of e – learning in public primary schools in Emuhaya Subcounty.
- 4) Identify challenges which implementers of e – learning are likely to face in public primary schools in Emuhaya Subcounty.

1.5.1 Research questions

The following questions were adopted for the study:

- a) What type of physical structures are available to facilitate the use of e – learning in public primary schools in Emuhaya Subcounty?
- b) What quantities of electronic hardware and software are available in public primary schools in Emuhaya Subcounty?
- c) How are the teachers prepared in terms of knowledge, attitude and skills for presentation of e – learning in public primary schools in Emuhaya Subcounty?
- d) What challenges are implementers of e – learning likely to face in public primary schools in Emuhaya Subcounty?

1.5.2 Research Hypothesis

There is no relationship between public primary schools preparedness and implementation of e – learning in Emuhaya Subcounty.

1.6 Significance of the study

The findings of the study may provide information useful to practising professionals, educationists, academic and policy makers. The information to educational planners may help to improve the provision of physical structures to facilitate the use of e – learning in primary schools. Heads of schools will have supplies of electronic hardware and software required for their institutions. The study will also provide information on teacher preparedness for presentation of e – learning and challenges they are likely to face during implementation.

1.7 Justification of the study

This study is undertaken to provide information on factors that would make implementation of e- learning programmes in public primary schools to succeed. The information would help in the improvement of education system so that Vision 2030 is realized.

1.8 Scope of the study

The study used teachers from class four to class eight and head teachers. The study focused on current and preceding years to obtain information about the system from respondents.

1.9 Limitations of the study

Initially participants were apprehensive but later cooperated. Teachers' indulgence in other school activities dragged the return of forms for analysis of data and compiling of report. Since schools were not typical, getting report findings for generalization could not be possible.

1.10 Assumptions of the study

The study made the following assumptions:

- a) All teachers in the selected schools were professionally trained and capable of handling learners from diverse backgrounds.
- b) All schools in the study had relatively equal socio – economic and physical backgrounds.
- c) All respondents co – operated and provided reliable information required for the study.

1.11.1 Theoretical framework

The study adopted Critical Success Factors (CSFs) theory designed by Freund (1998) on e – learning. The theory says that implementation of e – learning depends on factors which ensure operations of the system are effective. Provision of technology is a critical factor which influences the successful operation of e – learning system. The most important component is electronic hardware and software equipment. It needs proper storage to ensure there is adequate security and conducive learning environment for learners. It requires ICT trained staff that has knowledge and skills to handle computers and software programmes. Rosenberg (2001) says that e – learning requires needs assessment taking into account culture which represents the political ideals, interests and aspirations of society. The system requires appropriate instructors to be able to handle equipment and software programmes, and communication to stimulate change. Morales (2005) asserts that e – learning is the tool supporting knowledge management for organizations to accomplish information delivery.

The first objective spells out the need to have appropriate physical structures for e – learning. Appropriate physical facilities provide conducive learning environment fit for the system. Primary schools should strive to have computer laboratories that are able to house the equipment and learners. One of CSFs of e – learning is effectiveness of information technology infrastructure which plays important role in programme delivery as provided. Selim (2005) argues that the design of the structures should be appropriate to have sufficient ventilation and adequate space for other learning resources. The rural schools have old structures and need rehabilitation.

The second objective spells out the need to assess the quantities of electronic hardware and software equipment. This is the most critical element in e – learning. Instructional

process of ICT knowledge-based technology depends largely on electronic equipment. Computers depend on supply of electricity as a source of power. Selim (2005) says that the software which is connected to the internet requires funds to be available for sustenance of the programmes.

The third objective spells out the need to have teacher preparedness in terms of knowledge, attitudes and skills for presentation of e – learning. The success of this programme requires the establishment of training policy to ensure there are control mechanisms and creation of quality content. Teachers need to be trained on how to handle e – learning course content and structure. Their active participation requires them to have positive attitude towards and control of technology. They should be trained on teaching styles to encourage learners' motivation, interactive collaboration and technical competence. Morales (2005) asserts that e – learning users require suitable knowledge management that could help them to obtain the kind of content they need with correct and complete information as possible. Knowledge management is the premise and operational platform of e – learning systems.

Technology has become the most important factor among CSFs that influence the successful operation of e – learning system. So it is important to pay attention to the development of technology and corresponding tools. They are products that support e – learning system. Gasco (2004) argues that the CSFs of e – learning are based on training policy and objectives to maintain progress as a way of adapting the new programme.

He suggests seven CSFs of e – learning which include flexibility in time management for training, active participation of trainers, establishment of control mechanisms to ensure training occurred, creation of quality content, promotion of interactive elements among

trainers, use of standardized and developed technologies, and gradual implementation. Selim (2005) developed Structure Equation Model (SEM) to perceive CSFs of e – learning containing instructors' attitude towards and control of the technology, instructors teaching style, learners' motivation and technical

Muindi (2010: 10) asserts that more than half of teachers in public schools are computer illiterate. Before buying computers the hardware-software interface requires to be considered to avoid chances of technical mismatch in equipment. Jackson (2004: 23) argues that to remain competitive part manufacturers often introduce new parts or products. This must be checked before any supply of equipment is made.

Gasco (2004) says that implementation of e – learning requires use of standardized quality content and flexibility in time for management of training instructors. There are challenges that teachers may meet during implementation of e – learning. Wentling (2000) asserts that the largest hindrance to integrating e- learning with knowledge management is the traditional reliance of training. The teachers are so used to the conventional system that changing to the new innovation is not easy. There is need to initiate re-engineering of minds to facilitate a mentality of change, efficiency and sharing of knowledge.

1.12 OPERATIONAL DEFINITION OF TERMS

Electronic media –Use of ICT technologies in knowledge-best economy of education;

Instructional resources which make use of controlled motion and are used in the process of instruction

E – learning – Instructional process which takes place by using electronic media in particular computers or on-line instruction

Implementation – After recommendations had been made to initiate a new system, schools are supposed to carry out the planned activity

Innovation –New changes in education designed to bring benefits for schools

Preparedness – primary schools are required to put in place appropriate learning resources in order to carry out the planned activities.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter covers literature review in two parts. The first part looks at the general overview of literature concerning development of e – learning in primary schools. The second part covers specific literature concerning physical structures that are available for e – learning in public primary schools, electronic hardware and software, teacher preparedness in terms of knowledge and skills and challenges facing teachers in the implementation process.

2.2.1 Integration of electronic media in educational instructions

The increasing explosion of information, communication and technology (ICT) needs flexible learning and teaching approaches to be able to meet the challenges of the 21st century. Mukwa (2000) argues that the increasing explosion is the expanding knowledge and continued demand for education. Menjo (2008) says that integrating electronic media resources would supplement and complement traditional classroom learning and teaching.

The contemporary world has sophisticated electronic media such as the computers which could be integrated into the system. To operate them there is need to train teachers first and provide security to the hardware against vandalism a practice that is prevalent in rural communities. Learning and teaching is the concern of a trained teacher. Media is a powerful tool that influences the minds of those who use them. Kafwe (1998) says that media technology is ideal for young people to be engaged with educational material from the internet.

It advocates for training of teachers to know how to handle the media effectively. Learning is reinforced with learning aids of different variety because they stimulate, motivate as well as arrest learners' attention for a while during the instructional process. Developed countries have taken great strides towards exploitation of new and emerging technologies for instructional process. It is important to address the issue of funds in the development of educational projects. Efforts to initiate the same technologies in developing countries like Kenya are down played. Money is needed to purchase equipment and sustain the programmes.

Alternative way such as encouraging the participation of private sector should be sought because economic development of the country cannot be achieved without modern technology. Faced with deteriorating quality of education and poor academic results in the core subjects such as mathematics, one way is the use of integrated electronic media resources in schools. It would assist to reap the benefits of such an intervention. Application of electronic media resources is classified as hardware approach. However, the approach is not expected to replace the role of the teacher in the classroom. The media is supposed to supplement and complement the learning activities.

Multimedia is a very effective means of instruction. Multimedia arouses interest, attention and increased level of understanding. Intellectual development is supposed to be harmonizing with aesthetic education and works of art. The long term implications for the use of technology are profound both for the delivery of literacy education and for a new innovation. In view of that, it is possible to say that the world is fundamentally transformed by technology. Santhanan (1992) says that the approach mechanizes the process of teaching so that teachers are able to deal with more learners with less expenditure educating them.

2.2.2 The effects of school resources on teaching and learning

Teachers are the cornerstone or hub of any educational system and rated as the most important human resource in a school. No system could rise above the quality of its teachers. They are the pivot and upon their number, their quality and devotion depends on the success of any educational system. Pupils' academic performance relies on the qualification of teachers who teach them.

Ashworth (1994) argues that trained teachers are more reliable in delivery of quality services to the learners and their maximum utilization has a lot of benefits. Adeogun (2001) says that high teacher – pupil ratio in most public schools is as a result of non – recruitment of additional teaching staff to meet up with the increase in the enrolment which in turn affects the educational system. The government is expected to consider employing more teachers. What the government is doing is merely making replacement of retired teachers and those lost through natural attrition. The number could not match the ever expanding enrolments in public primary schools. Schools endowed with more material resources perform better than schools less endowed.

A very positive and significant relationship between instructional resources and academic performance exists. Instructional materials increase teacher's effectiveness because they augment, complement and supplement their effort. The magnitude of instructional resources makes teaching more productive and gives it a more scientific base. It makes teaching and learning more individualistic. It makes instruction more powerful, immediate and attainment of objectives easier.

Although teaching and learning could take place in any setting, physical facilities lacking basic structures are dangerous. Such structures need rehabilitation to ensure learners are protected. Health officials who are supposed to inspect and recommend on

physical facilities rarely do their duty as required by law. Teachers' professionalism is affected by physical environment. The most important environmental features which affect teachers' performance are classrooms, furniture and class equipment. Therefore, proper planning is expected to be done on school facilities. For instance, adequate and qualitative facilities are required for an effective learning and teaching to take place.

Fernandes (1995) argues that overcrowded conditions have negative impact on teachers' efficiency. Overcrowding due to inadequacy of physical resources affects teachers' professionalism, classroom activities and instructional techniques. In essence, availability in quality and quantity of suitable material and physical resources in good supply are crucial for the achievement of curriculum objectives. Bajah (1998) asserts that the quality of any education is judged by the effect of which it has on learners and society. Therefore, being literate and numerate in acquisition of technical and vocational skills is necessary for economic growth and sustenance. Also related to that was acquisition of fundamental knowledge, skills and attitudes the individual needs to function efficiently in the given society. Quality education refers to the scale of inputs or resources in the form of funds, equipment, facilities, teachers and learners.

It is important to note that the outputs or products of transactions of institutions are acceptable, desirable, beneficial, efficient or effective from the point of view of the school stakeholders. The stakeholders include the government, society, parents, private agencies and international bodies. When something has high quality it fetches a higher price on its face value.

Tamuno (1995: 5) says that acceptable standards of excellence concerning the environment of the school system provide high standards of quality education and would make the country produce highly skilled manpower with high demand in the world labour market. Teachers are required to be trained in new technologies if they are

expected to deliver from the curriculum the best of their effort self reliant young people who are ready to face the challenges of the present century with confidence.

2.2.3 Teachers' characteristics and their effects on learners' achievements

Goldhaber (2003) asserts that teacher quality has the greatest impact on learners' achievement gains among all educational factors and school resources. For learners, good teaching lasts a lifetime and a bad teaching limits their dreams and opportunities. What teachers know and can do is the most important influence on what pupils learn. The quality of teachers is the critical element of an effective schooling and pupils' learning. School inputs have more effect on learners' achievement independent of family and societal backgrounds.

Schools could make a difference and a substantial portion of that difference is attributable to teachers. Something has to be done to help improve declining standards of learning in public primary schools. It is important to know the types of inputs that are relevant and how schools could source out funds from their own budgets or educational grants. Given the situation of economy in the country, the prices of educational inputs are likely to go up and that would be a burden to the tax payer if the government decides to finance them in total. Therefore, alternative sources have to be sought to supplement government efforts to finance educational projects.

2.2.4 Teacher qualification

Coleman (1996) argues that qualification is the critical element of an effective schooling and pupil learning. Teacher qualification is expressed in terms of formal education and training. Different results have shown that teacher qualification correlates with learners' performance, hence it needs further investigation. Teaching as a human labour is an

important social factor that affects learning in schools. The quality of classroom teaching and learning depends greatly on how a teacher is qualified to handle learners. Formal education refers to the level of their academic qualification. Teachers have qualifications ranging from certificate to degree and are expected to help learners improve on learning and receive quality education. It has to be fundamentally established how the academic qualification influences the quality of classroom learning. The qualification of teachers is supported by formal training from teacher training colleges. This is to make sure teachers receive certificates which are authentic to reflect the skills acquired in colleges.

2.2.5 Teaching experience and teachers' attitudes

2.2.5.1 Teaching experience

The teaching experience appears to be a major factor of concern in teacher quality in public primary schools. There are various comments both positive and negative given about teaching experience. It is believed that experience is the best teacher. However, that is to be correlated with the performance of learners in public primary schools. Older teachers have long teaching experience and are veterans in settings that emphasize continual learning. Goldhaber (2003) indicates that the teaching experience between old teachers and new teachers appears to level off after some time.

They are expected to strengthen their collaboration with other teachers who are still new in the teaching profession. The collaboration is very important because if it is made to continue it would improve pupils' learning performance. Very well prepared beginning teachers are highly effective. Consultative meetings need to be encouraged amongst teachers both at school level and in forums outside the school.

2.2.5.2 Teachers' attitudes

Goldhaber (2003) asserts that attitudes have a profound impact on teacher practices and behaviours. Teachers have the opportunity to leave a permanent impression on their learners' lives. School experiences influence how children view about themselves inside and outside school. Their school memories have the potential to last a life time which could determine their present and future decisions. The attitudes include being a genuine caring and kind teacher, willingness to share responsibility, being sincere to diversity of learners, ready to stimulate learners' creativity and motivation to provide meaningful learning experiences.

2.2.6 School factors and quality of education

School factors and quality of education are considered important to affect the preparedness of public primary school in the implementation of e – learning programme. Eicher (1984) summarizes this quality in monetary indices as expenditure per pupil. The level of material inputs and their efficiency affect the quality of education offered. Effects of costs on quality and quantity of educational resources include other factors like school watchmen who perform a very important responsibility to ensure schools are secured in terms of security. Textbooks are precious resources which could easily be vandalized due to high market demand and could fetch attractive prices.

The installation of computers in the schools needs to be protected from theft because they are highly valuable. The risk involved in installing equipment and learning resources is high and therefore, quality of education can be improved by employing school guards.

2.2.7 Justification of ICT in school teaching and learning

Makau (1988) says that the computer is capable of transforming the teaching and learning transaction to a learner – centred process. The use of ICT in education is highly justifiable. ICT can be used as a catalyst to initiate changes in teacher pedagogical perceptions and

process. The integration of ICT in schools' learning has been argued to be an ideal way of improving and reforming the traditional curriculum process and pedagogy. The multimedia packages are more interactive in subjects like mathematics and sciences. They render learning easier and more pleasant. The effective use of ICT technologies offer new ways in which the quality, effectiveness and flexibility of education could be improved. ICT is also an effective mode of delivery of distant education through e – learning concept. ICT resources could help in the automation of the management and administrative processes such as timetabling, administration of exams, duty allocation to teaching staff and support personnel.

2.2.8 Teachers' professional development on quality of education in public schools

Osei (2006) argues that professional development increases the opportunity to interact with other teachers to get fresh instructional methods and new ways of assessing their learners. Teachers require continuous training on emerging issues in classroom management, curriculum implementation and for instructional implementation in their respective subject specialization.

Professional development could provide opportunities for teachers to grow personally and professionally to increase their capacity for effectiveness and efficiency. The professional development activities show the level of teachers' commitment to the school work which increases their skills and content knowledge through sharing of information.

2.2.9 Effects of integrated instructional approach and conventional methods of learning

Mukwa (2000) asserts that televised media utilizes media which has the ability to improve access to schooling for rural and urban groups of learners. ICT integration in teaching and

learning is an innovative and powerful method of instruction. Interesting activities for teaching concrete as well as abstract concepts are used. It involves the use of televised media and internet. It could be used in distance learning systems. Distance learning dissolves barriers of both distance and time to access schooling. The efficiency of instructional media is measured by the ability of the system providing education to most people in less time at lower costs and conveniently. Availability of time affects the programme and there is need for instructional media that could save on time and ensure that the syllabus is fully covered. The Kenyan system of education 8.4.4 is broad based in content.

Teachers require sufficient time to prepare the learning activities and to capture the weaknesses of each individual learner. With the conventional approaches much cannot be achieved because teachers are made to rush with the content aiming to beat time set for completion of the syllabus at the expense of guiding learners. The ideal learning situation needs to make use of a variety of strategies among which there is spoken information and use of visual – aids. Learning through both sight and hearing scores higher than hearing alone. The achievement of variables in teaching and learning are interconnected with the process of visualization.

Audio – visual aids integrated into teaching and learning process results to better learning and retention of information. Integrating media in instruction needs to prepare teachers through the process. The process requires funding of training of teachers and acquisition of equipment. The idea becomes even complicated where modern information technology is involved because teachers and learners manipulate the equipment and browse information on the internet. They need to have the system set without power interruptions and a reduction in costs of maintenance.

2.2.10 Financing of learning resources in public schools globally and in Kenya

Throughout the world education is seen as consuming the largest share of Government expenditure. The ever growing demand of education, the resultant expansion of educational system, rising costs of resources in education due to inflation, the need of sophisticated and expensive equipment have all led to massive increase in finance of education all over the world. There is increasing evidence of financial constraints and in many developing countries the proportion of the government budget devoted to education has begun to decline.

The shortages have been a consequence of governments' reduction in their expenditure on education. Complete reliance on central government revenues for financing development projects is no longer feasible and governments are expected to consider alternative ways of tapping the resources from the private sector. Sourcing funds from the private sector would encourage the government to raise the tax index on goods which could impact negatively on citizens. Grants from development partners have not been utilized well due to mismanagement. The budget allocation for education could not meet all the demands. Integrity on management of funds from donors is required to be upheld and increase the budget allocation of education to finance most of the planned activities.

In Kenya, education has continued to consume the largest share of government expenditure. Consequently, the government developed the philosophy of cost – sharing in education. The philosophy has taken root in the educational institutions and the problem of financing education from the public budget has proved to be a strategic issue facing the educational sector. MOEST (2005) report on strengthening delivery of education for all indicates that the government has found itself in a situation compelling it to increase financial expenditure on formal education in schools. Like any other developing country, Kenya has continued to experience severe shortage of financial resources required to meet

all the educational needs since independence. Alternative ways have to be sought to raise funds. It is very difficult to target the tax budget as the main source of revenue to finance projects when the country has a high poverty index among the citizens.

2.2.11 The internet as a revolutionary technology

The internet is touted as a revolutionary technology that would change the lives of many people. Rosenberg (2001) argues that the internet emerges as the most visible component of the dynamic development of information, communication and technology (ICT). The knowledge-based technology (ICT) is becoming an integrative part of national education policies and plans. The convergence of technologies in developing countries has become a driving force for educational reforms making it possible for teachers and learners to connect better information and ideas via effective combinations of modern technologies. With a wealth of learning resources on the internet, some freely available ICT, is altering the functions of libraries to digital services and librarians as computer experts and information managers.

A set back is poor connectivity of infrastructure which manifests lack of affordable access to personal computers, internet devices, modems, telephone lines and internet connections. Another setback is the slow development of ICT in many African countries mostly being a consequence of poor technical and financial management of telecommunications sector. In Kenya, the internet has developed rapidly but it is hampered by poor telecommunication facilities in various parts of the country. Communications Commission of Kenya (CCK) is expected to protect Telkom against competitors in internet exchange point. Computers in most African schools are often second hand and could not run complex software programmes. The electricity supplies are unreliable and access to computer rooms is limited due to competing demand from learners in schools with large enrolments. However, the problem is phobia which can affect learners and Goldhaber (2003) says that

owing to lack of training and familiarity with computers, some users find it hard to browse through the internet. That easily affects their attitudes.

Learning institutions worldwide indicate that the use of ICT has generally positive effect on the quality of teaching and learning. Survey conducted on e – learning technology in advanced countries, indicate that most learners have a strong preference for the internet to supplement traditional media. The internet is an attractive medium for searching and obtaining academic information accessible twenty four hours. The learners can visit a cyber café to obtain same information on the internet. They could choose between saving, printing or reading the information from the computer.

2.2.12 Factors affecting implementation of innovations in educational institutions

Osei (2006) argues that clarity of education programme can be achieved if the teachers understand the basic nature of the subject, its objectives, content, teaching methods, instructional resources, facilities and educational procedures. Clarity and awareness are factors that affect effective implementation of innovation. As it is known, effective implementation is a process more likely achieved through practice. Teachers may not see the need for change being advocated if they are not clear about what they ought to do. To ensure that teachers are well prepared for innovation effort is required to sensitize them in seminars and workshops. Trainers of teachers are expected to go through the same training. The whole issue as it can be seen involves funds conducting the seminars and workshops.

Any curriculum is primarily concerned with establishing objectives and adding ways of achieving them. Clear objectives determine the content teaching methods and instructional resources. Consultations with experts and more research are needed to find adequate information about problems impeding implementation of educational projects in the

country. New educational programmes are required to be relevant in terms of adequate resources and facilities. The availability and quality of instructional materials is important for the implementation process to take place. Besides, curriculum implementation requires change in the provision of relevant and adequate teaching and learning aids and facilities. A teacher who has adequate and relevant teaching materials is more confident, effective and productive. If methods have to be used effectively, there is need for resources and facilities.

In addition, employing more teachers and improving their pay package would also help to change the situation on the ground about implementing a new system in curriculum. Teachers need to be encouraged to take training in ICT and be rewarded by increasing his or her salary upon presentation of a certificate of training. It would make them take the programmes seriously and bear positive results.

2.2.13 Preparedness of public primary schools in implementing educational innovations

Kim (2002) argues that preparedness of schools lies within the provision of quality learning resources and facilities. Educationists acknowledge the complexity involved in the implementation of innovations and endeavour in search of different ways to realize success. Implementation of innovations takes place in social-economic, physical and political settings. Therefore, many factors intervene at all stages. Curriculum implementation is a process that the project staff and education authorities always look forward to with a lot of eagerness. The first thing to consider relates to the attitudes of teachers towards implementing the programme.

The attitude of teachers depends on their training capacity and how one is ready to receive the new programme. In addition, a lot of funds have to be spent on purchasing equipment

and renovation of the existing physical facilities. Implementation also means the process of putting into practice a developed curriculum. Implementing a new system in curriculum is costly and more effort is required to be put into the process to ensure success is achieved. All stakeholders need to be prepared which involves training schedules and even public awareness through media, seminars and workshops.

Given high poverty index in the country, public primary schools cannot be able to shoulder the cost of implementing an expensive programme such as e – learning. Implementation in curriculum could also be defined as a systematic process of ensuring that the new curriculum reaches its immediate beneficiaries, the learners. Planning of curriculum change is a very complicated process at every stage. For instance, financial and administrative policy cannot be divorced from it. The task of curriculum implementation involves persuading the people to change their attitudes, policy makers, administrators and teachers, trainers of teachers, school supervisors, parents, lay public and learners. The ultimate purpose is to make the process possible. It can be done by informing the public through mass media and personal contact, seminars, public lectures, etc.

The other task involves obtaining the necessary professional personnel to perform various roles in the process carefully locating them based on accepted criteria. The process includes training teachers through pre-service and in-service teacher education programmes, educating teacher trainers, educational administrators, inspectors and all those likely to take part in the process.

2.3 Implementation of e – learning in public primary schools

Teleconferencing is a new phenomenon in Kenya bound to bring a revolution in curriculum delivery. It is expected to help with addressing the perennial problem of

teachers' shortage. As much as that has been planned it is important to understand that the new changes in the curriculum cannot be easily implemented unless prior preparations are made focusing on challenges likely to come with the system.

2.3.1 Collaborative Development E – Learning Technologies

Welsh (2003) defines e – learning as the use of computer network technology primarily over or through the internet to deliver information and instruction to individuals. E – learning is instructional content or learning experiences delivered or enabled by electronic technology and requires sufficient time to train instructors. Van Braak (2001) argues that ICT usage fosters collaborative learning through flexibility and accessibility to education and knowledge. Technologies of e – learning depend on the internet and organization members who are not good with computer operations and have little IT knowledge can be hesitant to use the technologies. The problem may battle the successful operation of e – learning systems and reduce the knowledge learning level of organization. Collaborative e – learning may help to solve the problem through man-machine and man-made interactions. Defects of e – learning include lack of interpersonal communication, lack of excitement and dryness of materials.

Teachers are under increasing pressure to use information and communication technology to impart knowledge, skills and attitudes to survive in the twenty-first century. Although technology is developed to make learning easier, new skills are often needed to manage the new technology. Therefore, implementation may take a bit longer time to reach a complete transformative innovation of educational programme. Teachers need time for training in new technological skills in order to use them adequately.

MOE (2006) report indicates the first comprehensive and stakeholders – driven ICT policy in Kenya discussed and approved by the cabinet in January 2006. The ICT policy

document was published through Kenya Government Gazette notice No. 24 in March 2006. The mission of the policy is 'Prosperous ICT – driven Kenyan Society', which puts ICT in the centre of national development. The policy addresses issues of ICT in education. It is aimed at encouraging the use of ICT in education and promoting the growth and development of e – learning across all levels of education.

It is done in a bid to leverage learning and teaching. MOEST (2005) Sessional Paper 5 of 2004 on a policy framework for education, training and research whose vision is 'Quality education and training for development', targets to achieve Education for All (EFA) by 2015. The purpose of the policy is to integrate ICT into education and training systems. It is to prepare learners and staff of today for the Kenyan economy, and therefore to enhance the national ICT skills.

ICT enabled teacher education is fundamental. International and national authorities spend huge sums of money to facilitate the implementation of ICT teacher education. To understand and appreciate ICT integration in teacher education, it is useful to evaluate how it is being used as a catalyst for change in teaching, learning approaches and access to information. That attempts to focus on the quality of computer use and levels attained in terms of using ICT to support, expand and transform learning. This requires the use of Computer Practice Framework (CPF). The quality of computer use is still very low and there is a wide gap. In primary schools the CPF does not put into consideration the capabilities availed by the internet. A more expanded framework is needed to be developed to holistically evaluate ICTs in teacher education.

It contributes to the theory, practice and policy regarding ICT integration in education. In education ICT is seen as a way to promote educational change, improve the skills of learners and prepare them for global economy and information society. ICT is needed to be

combined with traditional technologies such as books and radios and more extensively applied to the training of teachers.

2.3.2 ICT in Teacher Education

Jackson (2004) asserts that the new technologies coupled with a worldwide challenge to educate all children, have led to the global reform and development of teacher education. Computers and related technologies have the potential to transform the nature of education. Teachers act the change for technology in education and it is essential that in – service and pre – service teachers have the basic ICT skills and competencies. Teachers require training that enables them to integrate ICTs into their teaching programmes. One of the major problems of introducing ICT to the training of teachers in Africa is the appropriation and distribution of budgets necessary for the implementations.

ICT in teacher education can be organized around four competencies. They are content and pedagogy that focuses on teachers' practices and knowledge of the curriculum, collaboration and networking among teachers to acknowledge communicative potential of ICTs to extend learning beyond the classroom, technical issues to enable teachers update their skills with software and hardware as new generations of technology emerge, and social and emerging issues that teachers require the competence to acknowledge technology brought with it new rights and responsibilities.

2.3.3 The use, effect and implications of Information and Communications Technologies

Kim (2002) asserts that some components of curriculum structure and delivery are abstract to the learners. Multimedia is the only tool with the capacity to make teaching and learning learner – centred. It is believed that substantial population of school going pupils already has access to multimedia resources at home chiefly for entertainment. The unsupervised exposure has the potential to be destructive if unregulated. However, stakeholders in the

education sector could reverse the trend by investing in the development and use of multimedia systems and learning resources in schools to improve quality of education provided. It is therefore necessary to modify the learning environment to make it learner friendly.

Multimedia is the use of text, sound motion, pictures and video computer data in digital communication. It also involves the use of storage using holding devices such as CD-Rom, internet, personal computers and flash disk. It leads to attitudinal hindrance of effective learning. Since by nature and design multimedia systems are interactive, their incorporation in curriculum development automatically transfers ownership to the learners.

2.3.4 Multimedia technology in curriculum delivery

Sharpe (2006) explains that access to multimedia technologies is on-line systems and schools need to get familiar with IT industry. Edelson (2001) says that increasing the number and access of computers in the classroom is very dynamic and interactive. E – learning application is essentially important to limit relative disadvantages that come with unequal learning and resource distribution. It includes teaching and learning facilities, teacher – pupil ratio and environmental constraints.

Multimedia technologies provide a basis for increased curricular and cultural understanding in primary schools. Potentially, multimedia offer a means of individualized learning but there is need to look into the learning environment within a school. In nomadic communities lack of stability and consistency in the learning environment denies learners necessary continuous access to classroom instructors or teachers and complementary facilities. Schools in Asal areas need special consideration to ensure no region is discriminated during implementation of e – learning programme.

The full potential of using multimedia technologies in primary schools can only be realized after there has been some re-engineering of learning experiences offered in the traditional primary school. Multimedia learning environment involves a number of components or elements besides hardware and software to enable learning to take place. Having the right type of equipment is not necessarily going to create the most appropriate environment for learning to take place. It needs to be combined with the exploitation of new systems of resource provision for schools. Although there is concern about security and access to undesirable internet materials, technical solutions can be developed by enabling software producers to develop an awareness of the range of learning styles deployed in primary schools. It is vital for teacher to be familiar with multimedia technologies in order to know how to use them within their curriculum areas. It demands improved appropriate in – service training for teachers in the area of multimedia technology in education.

The successful introduction and operationalization of the East African Marine Systems (TEAMS) fibre optic cable and the subsequent terrestrial connectivity, it is expected that there would be improved access to multimedia systems affordably. Existence of fibre cable technology from the telecommunication companies can ensure access to multimedia learning resources even in the remote parts of the country thereby uniformly distributing school curriculum content. The development of multimedia technology could offer access to knowledge far superior than that of most subjects taught. It could result in teachers developing new learning facilitation skills and reduce the emphasis on knowledge. Teachers require access to learning resources which could support concept development by learners in a variety of ways in order to meet individual learning needs.

2.3.5 Multimedia technology in curriculum development

The school curriculum is the skeletal structure used to generate syllabus content without which there would be no learning. The curriculum also highlights on broad national objectives at every level of learning. The curriculum as presently structured has not addressed educational needs of the nation and learners. There are some hindrances that could be readily overcome using new multimedia education technologies.

2.3.5.1 Fostering national unity and cohesion

Kim (2002) asserts that the use of multimedia technology can eliminate excessive reliance on teachers and facilities. It is the desire of the government and education policy makers to use school curriculum as a tool for promoting national unity. However, given the uneven education resource distribution in terms of facilities and teaching staff, it is impossible to meet the objectives. Some regions are geographically more endowed than others.

Teachers naturally resist posting in some disadvantaged regions. Multimedia is highly individualized and uniformly standardized. No region of the country can feel marginalized and discriminated in terms of education resource allocation. The quality of education cannot be compromised provided multimedia computers are available to all learning institutions. Unity cohesiveness can be achieved much more easily due to perceived homogeneity in access to learning resources.

2.3.5.2 Acquisition of foundation skills necessary for advancement

Goodridge (2001) argues that web-based training techniques in e – learning blends in with classrooms by making it practical oriented. At primary level, learners are conventionally considered to be inappropriately skilled to enter the workforce. The use of multimedia technologies in education would provide relevance and conformity. The present curriculum is considered academic which compels graduates to enroll for additional professional courses necessary to fit in the employment sector. Use of multimedia technology ensures

direct access to employment. The innovation requires a lot of commitment to implement e – learning programme for effective transformation.

2.3.5.3 Holding and retrieval

Hall (2000) says that the operations of digital communication and argues that www is the most appropriate tool for holding multimedia resources on the internet. Digital communication is increasingly becoming popular with users of internet.

Although holding multimedia resources on CD-Rom would remain important, the first route of access, the worldwide web (www) is a more flexible medium. A number of software tools which enable easy access and rapid assembly of multimedia components to high level methods of assembling multimedia learning resources are available.

2.3.5.4 Authoring and publishing

Initiatives to enable teachers to produce and publish high quality multimedia learning materials with the assistance of professional software developers have the potential to create a vast bank of learning materials through mega on-line library. But it is also important to stimulate teachers to utilize the resources for their own purposes. There is need to stimulate initiatives to enable the production of on-line publications of teacher-led high quality multimedia learning materials with the assistance of professional software developers. Kim (2002) supports this idea by asserting that e – learning via www has enabled thousands of people throughout the world to produce and publish information very easily and make it accessible to millions of others.

2.3.5.5 Professional development

Sharpe (2006) uses the term ‘Sustainable embedding’, to describe the transformative change as result of effective diffusion of e – learning. There is need to encourage innovative and sustainable ways of funding multimedia technology in schools. It would enable every teacher to have regular access to on-line multimedia systems for their own professional development and career advancement. An e – learning implementation was characterizes by activity.

It is proactive by permitting forward thinking and further planning to take place. E – learning could be rapidly deployed across new programmes or adopted in new approaches. There are inevitable hitches which come along with implementation of the programme and affect the effectiveness of transformative process.

2.3.5.6 Individualized learning

There is need for developmental work to be linked with software producers. It ensures that the academic quality of multimedia learning resources, their relevance for individualized learning needs and fair bench-marking using technology are very useful in forestalling any possible discrimination against less gifted regions and schools.

2.3.6 Complementary benefits of multimedia curriculum

2.3.6.1 Reduction in costs

Kim (2002) asserts that use of multimedia technology can reduce the costs with less teacher input required. The education sector presently consumes a massive share of annual government budget mostly to pay teachers salaries and to finance purchase of school equipment and facilities. The digital facilities would replace expensive physical facilities like books and laboratory apparatus. Since teacher responsibility would be reduced to facilitation process, decreased teacher population could result in savings. It could be channeled to other school education needs like tackling the key issue of resourcing

professional development of teachers and enabling them to make use of multimedia technologies as an important aid to learning.

2.3.6.2 Reduction on pupil needs

Kim (2002) says that pupil's individual needs can be met through multimedia learning resources because they are highly interactive and therefore, can eliminate discrimination based on background variations. Classroom settings are constituted with diverse needs. There are fast and slow learners, psychologically disordered learners, socially maladjusted learners, etc. Addressing individual needs in diversity is difficult. However, faced with high enrolments in Kenyan primary schools, success cannot be achieved easily.

2.3.7 ICT and teacher quality in knowledge-based economy

Kim (2000) argues that the success of learners relies heavily on the teacher quality which is dependent on the teachers' knowledge and makes the process of learning learner centred. The development of information, communication and technology (ICT), can influence teachers' quality. Evaluation of efficiency, equity of education and training through assessment of social rates of return, helps to measure the impact of education expenditure and attainment levels in society on economic growth. Implementation of e – learning programme may help to shift the teaching paradigm in education to a learning paradigm.

It means that education is no longer about how to deliver information and knowledge to the learner but about to help the learner search and discover information for themselves to create knowledge useful to their needs. Teachers are no longer responsible for information and knowledge. Teachers do not play a passive role, but have a clear vision to the creation and application of knowledge presented to the learners. In the digital knowledge-based

economy, teachers have new roles as change enablers, knowledge incubators and learning consultants. These roles are discussed below:

2.3.7.1 Change enablers

Kim (2002) asserts that change management is not only passively responding to changes but also active and intentional. In the context, the teachers' role shifts from someone who processes and presents knowledge needed to confront changes to that of a person who helps learners find knowledge needed to confront changes and actively displays self-development strategies. Teachers' role include guidance to help learners establish new visions for the future and encouragement of leadership for learners to help them initiate their own roles and to continue self-development.

2.3.7.2 Knowledge incubators

The control of information has been decentralized with advancement in digital network technology and the subsequent open information principle which allows people to network and share information. Kim (2002) says that knowledge creation by a few people has come to its limit and is giving way to knowledge creation by network of people who share ideas based on their own creativity and imagination. It is replacing the closed information principle that controls information within the hands of a few selected people. The teacher's role is not to be confused on that one who serves as the source of all the knowledge but one of a knowledge incubator to all the useful sources of knowledge.

2.3.7.3 Learning consultants

Future teachers are content experts of their subject matter and play the role of learning consultants who diagnose various problems that learners face and prescribe methods to facilitate learning activities. Kim (2002) says that digital literacy is the ability to share

learning outcomes with others and build various cyber communities. High teacher quality education requires co-ordinated policies and adequate resources at national level.

Teachers require knowledge and skills to appropriate, discover, develop and apply various types of methodology. In particular to utilize various digital learning resources, teachers need digital literacy, the ability to search, evaluate, edit process and utilize digitized information. Teachers with digital literacy play the role of learning-consultants to help learners acquire the abilities of information decoding, information navigation and information sharing. With changing environment, more is expected of our teachers' expectations placed on continued growth. The teaching profession is confronted by increasing complex challenges. It means that more investment is required in teacher education, as teachers need to be confident in their abilities and motivated in their work.

Teachers need to be supported throughout their careers. Continuous lifelong strategies for teachers are needed to be put in place so that teachers' skills are updated. It is generally accepted that the fundamental issues of education development could not be resolved in isolation from each other and are difficult to resolve in the absence of a co-ordinated framework. ICTs offer great hope for improving access, quality and efficiency of education. There is need to understand the key issues underlying the problems and formulate sensible strategies. There is widespread belief that ICTs would empower teachers, transform the teaching and learning process.

Kim (2002) argues that the knowledge-based economy diffuses knowledge through education and training and also needs creating new knowledge through research and development. ICTs could serve, rather than drive the implementation of education strategies. Technology is not the answer unless it reflects learners' needs and suit their environments. To have teachers is crucial for the economic growth and development of a nation. It is because teacher quality has a direct impact on the quality of education and the

success of the learners. It requires such knowledge to be applied to everyday life through technology and innovation. Considering that teachers prepare young people to be lifelong learners, teachers are expected to have a wide range of development opportunities with greater focus being placed on skills and training within the teaching profession. To guarantee quality, teachers need physical and professional environments in which excellence in innovativeness are recognized as driving factors.

2.3.8 Schools as preparation for the future

Schools are indeed the basis on which an account for human diversity could be made. The learners' academic self-concept, motivation, previous academic performance, learner expectation and taste orientation are also important for success. Gibson (1997) asserts that an introvert is more successful in an on-line learning environment. Self-directedness and computer self-efficacy have been found to be important for learner satisfaction with on-line learning. Major technology developments have been experienced from learning from computers to mobile devices integration, use of face-book and development of virtual communities used as formal and informal educational tools. Technology radical changes should be reflected in school practices, in order to adequately prepare learners to become successful citizens in the society. Educational systems are required to develop appropriate mechanisms within their practices to integrate and promote a new culture of work, learning and communication through technology.

As the society is becoming increasingly sophisticated, the basic necessary skills kept changing too, thus more and more requirements are placed on the learners in order to become qualified citizens. The educational system is expected to respond and address the new needs and requirements. Learners need to be prepared to play the role of the knowledge worker that keeps evolving always related to advanced technology.

2.4 Systems Theory

Senge (2000: 19) asserts that every organization is a product of how its members thought and interacted. The systems theory is a powerful tool in educational transformation. So if one wanted to improve a school system, it is appropriate to look first to the ways that people thought and interacted together before changing rules. Educational system changes in response to environmental changes. Open systems have direct relationships and interactions and they are influenced by their environment. The method to change the systems is through systems design.

2.4.1 The roadmap: The process of systematic change

Any kind of innovation needs careful design, development and implementation. There is need for persistence, patience and collaboration among stakeholders with a common vision agreed upon to pursue. Quick-fix approaches do not help the policy makers and educators to achieve their goals. In order to redesign the educational systems to head towards rapid technology changes, a plan needs to be developed. Banathy (1991) says that there is series of deliberate steps to involve stakeholders in preparing, planning and implementing a new approach. There are specific steps of what the process and principles of the journey towards systematic change are supposed to be.

2.4.2 The change agents' team

Systems change needs guidance and require stakeholders' participation. The lead – change agent is expected to be educated in educational technology and systematic change. The researchers call the process of becoming familiar with the system as the preparation phase. Through the phase the lead – change agent is responsible to make initial contact with the system and inform stakeholders about the innovation. The lead – change agent needs to learn how the system works and introduce himself to the system's major representatives.

Squire (2000) asserts that the lead – change agent is expected to be visible and apparent in the system, create relationships with major stakeholders, make visits to schools or districts and discuss with the teachers. The major challenge is to help stakeholders to transcend and evolve their mindsets regarding technology integration. They are required to advise on how to approach the educational reform, create and take ownership, promote commitment and take over roles of responsibility. The change agents' team needs to make an effort to gain and build political support from the teachers' unions and parents' associations. Banathy (1991) says that the core and design teams are required to be formulated. Emphasis is specifically laid on designing the transformation of the system. The design is one of the most important, complicated and difficult processes of roadmap towards technology integration.

2.4.3 The implementation plan

Before implementing the action plan, there is need to evaluate it in terms of cost, time, infrastructure and human resources to ensure its feasibility. After having a feasible model for the new system, then implementation needs to be planned. Innovation is the starting point of change and transformation could only be achieved through long term commitment and institutional leadership. Senge (2000) says that the revised plans are still aligned with the original vision so that the outcomes of the designs are what every stakeholder expects. Competency, learners' interactive collaboration, e- learning course content and structure, institution technology infrastructure, effectiveness of information technology infrastructure and organizational support of e – learning activities.

2.5 Challenges facing implementation of e - learning

The policy should be strengthened to provide integration of ICT programmes in primary curriculum. Together with institution's leadership, the IT managers are required to set IT objectives and targets to be achieved at the school level. Without doubt, the government

would appreciate that as its part of performance management in vision 2030. Inappropriate quality of hardware and software in learning institutions could also be an indication of weak or lack of IT management staff.

Stringent measures are needed to provide maintenance services to equipment and funds to run ICT instructional programmes. Before buying computers the hardware-software interface is required to be considered to avoid any chances of mismatch. Various challenges have been cited that face implementation of e – learning. Lack of management support and commitment is a very big problem to implementation of e – learning programmes.

Management is the hub of administration and if support is not forth coming from it, then no substantial activity may be carried out in an institution. It ensures policies and guidelines of a system are enforced by implementers. Jackson (2004: 23) asserts that to remain competitive, part manufacturers often introduce new parts or products and discontinue older parts.

IT problems include workload, band width and internet speed that can affect efficiency of teachers. It is expensive to manage the high cost of broad bands on internet coupled with the workload disposal. Lack of strategic planning is a problem in implementation of e – learning. There is need to put in place strategic plans such as budgets, piloting to test feasibility and evaluation. There is fear of change which is a normal phenomenon with human beings. Some teachers are overcome with fear to have hands-on the equipment. It is a phobia an individual has over objects and it could take a long time to convince such a person to get basic training skills in ICT. They are so used with the conventional system

that changing to a new innovation is not easy. Some people even would start feeling intimidated and resort to internal resistance.

Technological accessibility, convenience and economical advantages of e – learning as key drives for integration cannot be met due to the resistance. Serious consideration of e – learning technology has not been taken. Time factor is very important in development of e – learning programmes. ICT technology is dynamic world over and institutions need to get prepared for any eventual changes. The cost of buying new equipment and maintenance, need to be well planned in the school budget. A good budget is a very effective instrument in the running of institutional programmes. E – learning centres and establishment of e – learning standards and specifications are not available.

Wentling (2000) says that the challenge of integrating e – learning with knowledge management depends on re-engineering of minds to facilitate the planning of strategies based on common objectives if an organization does not guarantee integration of e – learning in the national context, then objectives and the best e – learning products cannot be addressed. Educational and training initiatives supportive of new managerial mindset should be created. Lack of physical infrastructure such as computers, laboratories and guidelines pose a hindrance to teachers who have trained in ICT and cannot practise. Muindi (2010: 10) asserts that nearly half of teachers in public schools are computer illiterate. Leadership of some schools has organized training sessions during school holidays but they have not made it compulsory for their staff to attend them. Hence, such trainings are attended by few staff as the rest remain illiterate in IT. There are demands of managerial education with a view of reinforcing a mentality of change, efficiency, hard work, sharing of knowledge and fostering of community practice.

2.6 Summary

The chapter involved literature review based on understanding of what other scholars had done related to this study. The review includes looking at what modern learning theories emphasized on learners' autonomy in the classroom because with time and facilities they could construct knowledge for themselves and others. The increasing explosion of information and technology calls for flexible learning and teaching approaches to be able to meet the challenges of 21st century.

Expanding knowledge is coupled with continued demand for education and teachers need to be trained to ensure their maximum utilization and effective professional practice in primary schools. To ensure they are well prepared for innovation, effort is required to sensitize them together with other stakeholders in training schedules and even public awareness through media, seminars and workshops. Teachers' professionalism is affected by environmental features and therefore requires proper planning of school facilities to be done. Attitudes have a profound impact on teacher practices and behaviours to provide meaningful learning experiences. It is actions employed by teachers which help learners because they play important role in classroom management. The most critical element of an effective teaching and learning is a function of the quality of the teacher and within that context they are required to be supported by formal training in ICT.

Effects of costs on quality and quantity of educational resources include other factors like school watchmen who perform a very important responsibility to ensure schools are safe in terms of security. The risk involved in installing valuable equipment like computers is high and therefore, quality of education could be improved by employing school guards. Given the situation of the economy in the country, the prices of educational inputs in e – learning is a burden to the taxpayer if the government decides to finance them in total. Alternative sources are needed to supplement government effort.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The chapter presents design of the study and methods used to obtain data. It covers area of study, study population, sample and sampling techniques, research instruments, methods of data collection, methods of data analysis and ethical considerations.

3.2 Research Design

This study found ex-post facto design useful because it looked at how public primary schools got prepared for the implementation of e – learning programmes. Kerlinger (1973) asserts that a researcher would not have direct manipulation or control over events already occurred. Teachers are aware about the introduction of e – learning in schools. Information required about them depends on inferences to establish the relationships given the existing conditions in public primary schools. A study of independent variables is made and a comparison taken to establish the effect of relationships on dependent variable.

3.3 Area of study

The study was conducted in Emuhaya Subcounty which has eighty three public primary schools spread in two divisions namely Luanda and Emuhaya. There are forty six schools in Luanda and thirty seven in Emuhaya. The public schools have registered over 500 pupils.

The selection of the subcounty was based on the fact that the area is one of the densely populated areas in the country with large number of schools lacking basic learning equipment and facilities as provided in the Subcounty Strategic Development Plan (2008 - 2018) advocating for development and maintenance of school infrastructure. The general trend in the Subcounty is that currently education standards have been declining compared to other years in the past.

3.4 The Study population

The study focused on public primary schools drawn from Emuhaya Subcounty because they run on the same management structures and procedures set by the Ministry of Education. The subcounty has eighty three public primary schools from which 664 teachers were selected to form the study population. The teachers are professionals comprising mainly class teachers versed with primary curriculum and handling children of diverse background.

3.5 Sampling procedures

Emuhaya Subcounty has 83 public primary schools from which 25 schools were selected using simple random sampling procedure as an optimum size likely to provide increased precision in the estimates of population properties (Appendix IV). A larger sample may give negative results and therefore is not appropriate to pick on. Each school provided 8 teachers purposively selected to form a sample size of 200 respondents as shown in the table 3.1 below.

Table 3.1 Study population and sample sampling framework

Division	Population	Sample				
		Class 4	Class 5	Class 6	Class 7	Class 8
Luanda	368	12	12	12	22	22
Emuhaya	296	18	18	18	33	33
Total	664	30	30	30	55	55

Source: Survey data

The sample size was large enough which led to increased precision in the properties of population estimates. Kothari (2004) says that if the sample is large enough or of optimum size it gives a confidence level of desired width to achieve the objectives. If too large it may incur huge costs and waste of resources. The class teachers gave information on e – learning physical facilities, acquisition of computers, supply of power, and acquisition of ICT knowledge and skills. The data was collected from 25 public primary schools.

3.6 Data collection instruments

The study used one questionnaire for class teachers (Appendix I) sent personally to teachers in their schools for administration. The items were drawn to capture the various aspects of the research problem covering an assessment of physical structures, electronic equipment, teacher preparedness and challenges they faced in the implementation. Both structured and unstructured questions were used to probe for in-depth responses.

3.7 Data collection procedures

Permission to collect data was sought from the Emuhaya Subcounty Education Office through Ministry of Higher Education Science and Technology. The questionnaires were personally taken to schools for delivery to respondents. The purpose was state the intention of the study and to create good relations. The questionnaire was explained clearly to the respondents and allowed two weeks to fill and submit them. First a pilot study was undertaken two weeks before actual study for pre-testing of the tools so that any defects detected in construction of items were identified and corrected. Second round of the visit took place in research study schools where respondents were given two weeks to fill the questionnaires. Duly filled forms were collected personally from respondents.

3.8 Validity

The supervisors and colleagues undertaking research studies from Moi University helped to scrutinize the data collection instruments to ensure that there was no ambiguity. The items were appraised to ensure that they were accurate and consistent with the study to give the meaningfulness of inferences.

3.9 Reliability

Kerlinger (1973) says that reliability is known as a measure of the degree to which the instrument yields consistent results after repeated trials. A pilot study was conducted immediately after preparation of the first rough draft of the questionnaire for pre-testing the tools of class teacher questionnaire which helped to create precision and obtaining accurate information. The data was analyzed and scrutinized to amend areas with defects. It helped to determine the reliability of the tools and to write up an improved questionnaire. Cronbach Alpha coefficient was used to test the instrument and it gave a reliability coefficient of 0.8344 (SPSS) considered positive and acceptable.

3.10 Data analysis

The data collected from the questionnaire was processed and analyzed then coded into categories. They were assigned numerals to quantify them so that Chi-Square (χ^2) as non-parametric test was used to find relationships between variables. Tabulation and frequency process were used with data converted into percentages of 0 – 100 range. The null hypothesis was tested at 0.05 level of significance using Spearman's rank correlation test. The test assumes the data collected is measured on ordinal scale. The Spearman's rank correlation was obtained as 0.7397 (SPSS).

3.11 Ethical considerations

Anonymity of respondents is important and requires to be observed with all due respect for instance by not indicating their names on the questionnaire forms. In this study, situations that could get a person into trouble or to stigmatize them were avoided. Personal etiquettes such as respect, trust, honesty and discipline were taken into consideration. This is supported by Newman (1994) who asserts that information received from respondents should be treated with privacy and confidentiality to protect their rights as human beings.

The study safeguarded against fraud in faking data or making a false presentation of another person's research methodology and results. Another person's work or ideas was not reproduced in the study without acknowledging the author. The study observed all the legal professional requirements of integrity in research by obtaining a permit from the National Council for Science and Technology (NCST) attached as Appendix III.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

The chapter presents the findings and discussions of data collected. It is divided into four sub-sections: Physical structures available to facilitate the use of e – learning, quantities and quality of electronic hardware and software available, teacher preparedness in terms of knowledge, attitudes and skills; and challenges implementers are likely to face.

4.2 Physical structures available to facilitate the use of e - learning

The study sought to identify physical structures available to facilitate the use of e – learning in public primary schools. To do this, teachers who were respondents were asked to provide information on availability of e – learning classrooms and the quality of physical structures. The data collected in the form of frequencies was computed into percentages as shown in Table 4.1.

Table 4.1 Available physical structures to facilitate e – learning

Table 4.1 shows physical structures available to facilitate e – learning in public primary schools.

Statement	Level of satisfaction		Total
	Yes	No	
Availability of computer labs	54 (32%)	115 (68%)	169
The quality of physical structures	45 (27%)	124 (73%)	169

Source: Responses from sampled schools

Despite having few computer labs in schools, from Table 4.1 above it can be observed that 32% of public primary schools had classrooms that could probably be used for e – learning and 68% did not have. Schools with quality physical structures formed 27% compared to larger proportion of schools 73% where the quality was low.

From the teachers' responses it was noted that lack of computer labs impeded the process and achievement of objectives of implementation. The classrooms that are available in schools do not have the acceptable standards for e – learning. The government can provide grants for construction of computer labs or alternatively the school management may also ask for funding from donors in the private sector.

When constructing computer labs the increased class enrolments should be considered because the same could also affect teachers' professionalism. This argument is supported

by Bartiz (1995) who asserts that overcrowded classes due to inadequacy of physical resources affect teachers' instructional techniques. Although teaching and learning could take place in any setting, it is important to ensure appropriate physical facilities are available for teachers to be effective. The relationship between availability of computer labs and the need of financing them was tested using Chi-square (X^2) and frequencies in Table 4.2 given below.

Table: 4.2 The need of financing physical structures

Table 4.2 indicates the need to finance physical structures.

Item	Frequency					Total
Computer labs	27	24	24	22	18	115
Financing of physical structures	25	21	19	24	22	111
Total	52	45	43	46	40	226
$E_i = \frac{\text{Total } O_i \times \text{Total } O_j}{\text{Grand Total } O_{ij}}$	27	23	22	23	20	
Grand Total O_{ij}	26	22	21	23	20	
$X^2 = \frac{(O_i - E_i)^2}{E_i}$	0	0.04	0.18	0.04	0.2	0.98
	0.04	0.05	0.19	0.04	0.2	

$$c = 5, r = 2$$

$$df = (c - 1)(r - 1) = 4$$

Source: Responses from sampled schools

From the table 4.2 above the calculated value $CV = 0.98$ where $c = 5$, $r = 2$, $df = 4$ and the table value $TV = 9.488$ at 5% level of significance. Since CV is less than TV , the null

hypothesis is rejected meaning that there is a difference. The variables are independent and show no relationship. Public primary schools do not have computer labs, causing constraint to implementation of programme.

4.3 Quantities of electronic hardware and software available in public schools

The quantities of computers were determined as shown in the table below under the following variables: New and functional, old and maintained, new but not functional and none.

Table: 4.3 Quantities of computers in public primary schools

Table 4.3 below shows quantities of computers found in public schools.

Statement	No. of computers	Responses
New and functional	1	5 (3%)
Old and not maintained	1	2 (1%)
New but not functional	1	2 (1%)
None	0	160 (95%)
Total	3	169 (100%)

Source: Responses from sampled schools

Respondents were asked to state the number of computers available in their schools. From the table 4.3 above, 160 (95%) respondents said there were no computers in their schools and 9 (5%) reported having at least one computer. On quality of computers respondents

indicated as follows: new and functional 5 (3%), old and not functional 2 (1%), and new but not functional 2 (1%). From the findings of the study it is evident that the objective of implementing e – learning programmes in public primary schools may not be achieved because the computers are very few.

Head teachers gave reasons why they did not have computers in their schools. They indicated that lack of funds was a critical factor. The programme was expensive to run and without funds implementation could not be possible. The source of power to run the software was electricity and due to the involvement of financial implications, installation was not easy. They said that rural communities had a high poverty index and it was difficult for schools to raise funds for purchasing computers. There are three schools in Emuhaya Subcounty which indicated that they had at least a computer.

Schools need computers because it is a powerful tool that can influence the minds of learners. Teachers should be engaged with the internet and know how to handle the media effectively. Provision of security is required for computers against vandalism prevalent in rural areas. This information is also complemented by Kafwe (1998) on media technology as a way of bringing new ideas and information meant to educate, mould and shape individuals especially young people in the society. Public primary schools should have measures in place to source funds for purchasing of computers. This sentiment is enjoined by Mukwa (2008) who comments at the issue of increasing enrolment in public schools. He indicates that as schools purchase computers they should put into consideration the ratio of the learners per computer to make e – learning effective and meaningful. A report of the study by Menjo (2008) complements Mukwa (2008) view of integration of electronic media resources in the traditional classroom learning and teaching.

4.4 Teacher preparedness in terms of knowledge, attitude and skills

The study sought to determine how teachers were prepared in terms of knowledge, attitudes and skills to present e – learning instructions. The data was presented and discussed in the following sub-topics:

- Number of ICT trained teachers
- Acquisition of computer skills by primary school teachers
- Teachers’ attitude on e – learning method of instruction
- Attendance of primary teachers in e – learning seminars

4.4.1 Number of ICT trained teachers in public primary schools

Table 4.4. The number of ICT trained teachers in public primary schools

Table 4.4 below shows responses regarding the number of ICT trained teachers on staff.

Statement	Frequency		Total
	Yes	No	
ICT trained teachers in public primary scho	78 (46%)	91 (54%)	169 (100%)

Source: Survey data

The table 4.4 above indicates that 91 (54%) respondents said their schools did not have ICT trained teachers who could handle e – learning lessons. Only 46% of teachers in Emuhaya Subcounty can operate a computer. Effective implementation of the programme could not be achieved because the number of ICT teachers in schools is still low.

Their training skills in ICT cannot be put into practice because there are no computers in schools. Another factor which also slows down implementation of the programme is teachers' lack of commitment to e – learning. The commitment shown by teachers in the programme would help them improve their quality.

As it can be observed from Table 4.4 above training teachers in ICT is necessary and the government should take initiative to train them. This provides teachers with opportunity for professional development in knowledge-based e – learning. Coleman (1996) says that the critical element of an effective schooling and pupil learning is function of the quality of the teacher. Osei (2006) argues that teachers' professional development increases the opportunity to interact with other teachers to get fresh instructional methods.

4.4.2 Acquisition of computer skills by teachers in public primary schools

Table: 4.5: Acquisition of computer skills by teachers

Table 4.5 below shows the mode of acquiring computer skills by primary school teachers in Emuhaya.

Mode of acquiring ICT skills	Number of respondents
Self- initiative	9 (5%)
Sponsored programmes	1 (1%)
TTC	15 (9%)
ICT College	35 (20%)
Through University	3 (2%)
Cyber	2 (1%)
Through High School	5 (3%)
Seminars	7 (4%)
Previous employment	1 (1%)
None	91 (54%)
Total	169 (100%)

Source: Survey data

From the table 4.5 above, it is evident that teachers have acquired ICT skills through various means. Out of 169 (100%) respondents, those who acquired the skills through self-initiative were 9 (5%).

By attending ICT colleges 35 (20%) respondents indicated their participation. Teachers who acquired the skills by interacting with owners of cyber cafes were 2 (1%) respondents and previous employment, 1 (1%) respondent. Through sponsored programme it was 1 (1%) respondent. It is also noted that teachers have been able to acquire the skills through high schools 5 (3%) respondents, at university 3 (2%) respondents and through TTC 15 (9%), through seminars 7 (4%) respondents. It is evident from the results in the table above that overall 78 (46%) respondents had ICT skills and 91 (54%) did not.

Teachers and learners in public schools do not have access to computers; hence creation of a phobia that affects their attitude is prevalent. The phobia could be eliminated if teachers are encouraged to attend nearby e – training institutions, seminars and workshops to improve on their manipulative skills. Communities can also start cyber cafes as Collaborative Development E – learning Technologies which depends on internet to help learners access ICT training. The system is able to create interpersonal communication and increase knowledge and skills.

The use of e – learning approach would not succeed without provision of computers and training of teachers. The study conducted by Goldhaber (2003) looks at training and familiarity with computers as very important because it helps the users to learn how to browse on the internet. It says that the training improves on the quality of the teacher and

education of the learners. On other hand the study by Bajah (1998) indicates that the quality of any education is judged by the effect it has on learners and society which is broad based.

4.4.3 Teachers' attitude on e – learning

Table: 4.6 Teachers' attitude on e – learning

Table 4.6 below gives a picture of teachers' attitude on e – learning.

Statement	Yes	No	Total
Teachers in the school are ICT trained	58 (34%)	111 (66%)	169
Attendance in e – learning seminars	49 (29%)	120 (71%)	169
Ability to operate computer	54 (32%)	115 (68%)	169
Teachers interested in e – learning instruction	157 (93%)	12 (7%)	169

Source: Survey data

The results of study in table 4.6 above, indicate that 157 (93%) respondents said they were interested in e – learning against 12 (7%) who did not have interest. ICT trained teachers in public schools had 58 (34%) respondents against 111 (66%) not trained. A large proportion of teachers have not attended e – learning seminars as indicated by 120 (71%) against 49 (29%) respondents who attended. Those with ability to operate a computer were represented by 54 (32%) respondents and 115 (68%) could not.

The responses indicate that there is still a wide gap in the provision of quality e – learning resources in public schools.

Table: 4.7: Relationship between teachers' attitude on e – learning and acquisition of ICT skills

Table 4.7 blow shows relationship between teachers' attitude on e – learning and acquisition of ICT skills.

Item	Frequency					Total
Teachers interested in e – learning	34	31	35	28	29	157
ICT trained teachers in schools	20	21	22	23	25	111
Total	54	52	57	51	54	268
$E_i = (\text{Total } O_i \times \text{Total } O_j)$	32	31	33	30	32	
Grand Total O_{ij}	22	22	24	21	22	
$X^2 = (O_i - E_i)^2 / E_i$	0.13	0	0.12	0.13	0.28	1.66
	0.18	0.05	0.17	0.19	0.41	

$$C = 5, r = 2$$

$$df = (c - 1) (r - 1) = 4$$

Source: Responses from sampled schools

Chi-square (X^2) computation was carried out on relationship between teachers interested in e – learning method of instruction and ICT trained teachers in school using table 4.7 above.

Calculated Value CV = 1.66 and Table Value TV = 9.488 at 5% level of significance.

Since CV was less than TV, the null hypothesis was rejected meaning there was a difference. There was no relationship between the variables because they were independent meaning that implementation was not taking place in public primary schools though 157

(93%) respondents in table 4.6 indicated they had interest in e – learning method of instruction.

The Computer Practice Framework (CPF) in primary schools should be initiated to provide a more expanded framework to holistically evaluate ICTs in teacher education. The framework contributes to the theory, practice and policy regarding ICT integration in education. Teachers should have training that would enable them to integrate ICTs into their teaching programmes.

It would be important to adopt the UNESCO (2002) report on e – learning which explains that ICT teacher education can be organized around four competencies. The competencies are content and pedagogy, collaboration and networking, technical issues, social and emerging issues. The whole idea is to improve on teaching and learning practices. This information is underscored by Goldhaber (2003) who asserts that attitudes have profound impact on teacher practices and behaviours. However, a report by Santhanam (1992) argues that the approach mechanizes the process of teaching so that teachers are able to deal with more learners with less expenditure of time educating them. It means the approach makes learning more practical and scientific.

Table: 4.8 To determine most popular instructional method in public primary schools

Table 4.8 below indicates the degree at which instructional method is undertaken by teachers.

Method	Least	Most	Total
Discussion	66 (39%)	103 (61%)	169 (100%)
Radio	92 (54%)	77 (46%)	169 (100%)
E – learning	157 (93%)	12 (7%)	169 (100%)
Question and Answer	32 (19%)	137(81%)	169 (100%)
Field Trips	104 (62%)	65 (38%)	169 (100%)

Source: Survey data

From the results in the table 4.8 above, discussion method had least 66 (39%) respondents against most 103 (61%). Radio had 92(54%) respondents least against most 77 (46%). On question and answer method 137 (81%) respondents indicated most against least 32 (19%). E – learning had 157 (93%) respondents reporting least against most used 12 (7%) . The reasons given were due to lack of computers, electricity and ICT personnel. It is evident from the table that question and answer is most used, and e – learning least used. In view of that, implementation of e – learning is not carried out in public primary schools.

Table: 4.9: Availability of computers and electricity in schools

The table below shows the relationship between computers and the source of power.

Item	Frequency					Total
Availability of computers in school	36	33	33	30	28	160
Electricity installation	30	27	29	25	22	133
Total	66	60	62	55	50	293
$E_i = (\text{Total } O_i \times \text{Total } O_j)$	36	33	34	30	27	
Grand Total O_{ij}	30	27	28	25	23	
$X^2 = (O_i - E_i)^2 / E_i$	0	0	0.03	0	0.04	0.15
	0	0	0.04	0	0.04	

$$c = 5, r = 2$$

$$df = (c - 1)(r - 1) = 4$$

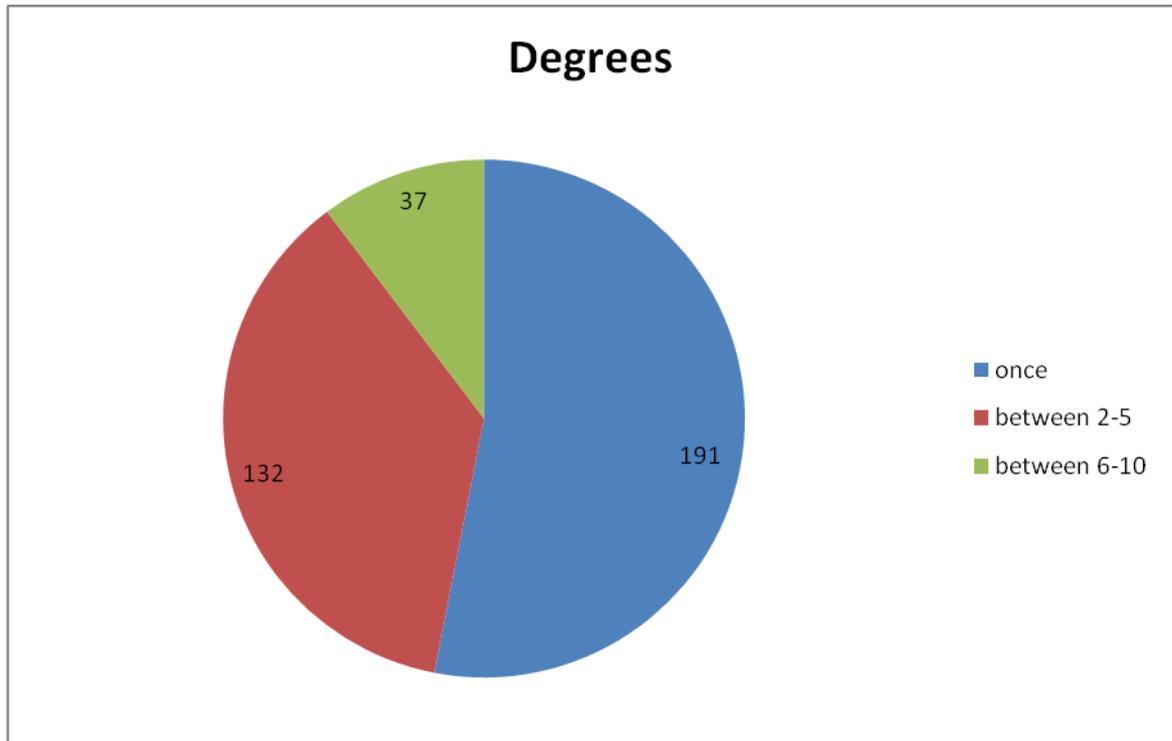
Source: Responses from sampled schools

Chi-square (X^2) was calculated to determine the relationship between availability of computers and installation of electricity in the school using the table 4.9 above. Calculated Value $CV = 0.15$ and Table Value $TV = 9.488$ at 5% level of significance. Since CV was less than TV , the null hypothesis was rejected meaning there was a difference. There was no relationship between the variables because they were independent meaning the schools were not prepared to implement e – learning programmes because they neither had computers nor electricity.

4.4.4 Attendance of primary teachers in e – learning seminars

Figure: 4.1 Attendance of primary teachers in e – learning seminars

The figure 4.1 below shows the degree at which teachers attended e – learning seminars.



Source: Survey data

From figure 4.1 above it can be observed that out of 169 (100%) respondents, 49 (29%) attended ICT seminars with 26 (15% or 191°) visiting once. Those who visited between two and five times were 18 (11% or 132°) and between six and ten times were 5 (3% or 37°) respondents. Those who never attended seminars were 120 (71%).

Teachers' commitment to attend ICT training courses was quite low. Teachers need training because e-learning is delivered by electronic technology via the internet and requires them to be adequately prepared. Implementation of e-learning programme is highly justifiable as an ideal way of improving and reforming the traditional curriculum process and pedagogy. They render learning easier and more pleasant. Teachers require continuous training on emerging issues in classroom management, curriculum implementation and instructional delivery. Teachers are expected to deliver from the e-learning curriculum the best of their effort self-reliant young people who are ready to face challenges with confidence. The professional development activities acquired in seminars shed light on teachers' commitment to school work which increases their skills and content knowledge through sharing of information.

Attending e-learning seminars provides opportunities for teachers to grow professionally. Osei (2006) argues that teachers' professional development increases the capacity for effectiveness and efficiency by interacting with other teachers. It helps them to get fresh instructional methods and new ways of assessing learners. Tamuno (1995: 5) says that for high quality education to be achieved acceptable standards of excellence concerning school environment must be covered.

4.5 Challenges implementers of e-learning are likely to face in public primary schools

There are challenges of implementing e-learning programmes in public primary schools which are discussed under the following sub-topics: Security for e-learning equipment, financing of e-learning programmes, stakeholders' sensitization on e-learning,

installation of electricity in public primary schools, management support for e – learning and implementation of e – learning.

4.5.1 Security for e – learning equipment in public primary schools

Table 4.10: Security for e – learning equipment

Table 4.10 below shows availability of security in public schools which ensures the safety of computers.

Statement	Frequency		Total
	Yes	No	
School security	105 (62%)	64 (38%)	169 (100%)

Source: Survey data

From the table 4.10 above the results show that 105 (62%) respondents indicated security services in public primary schools were available in terms of human resources against 64 (38%) who did not agree.

Primary schools require computer laboratories to ensure that the equipment is safe. Computers are highly valuable and the risk involved in installing the equipment and other learning resources is high. Eicher (1984) asserts that school watchmen perform a very important responsibility and their employment could ensure e – learning equipment in public primary schools are secure. This information is true given the results of the study showing how teachers were satisfied with provision of security in schools.

4.5.2 Financing of e – learning programmes in public primary schools

Table 4.11: Financing of e – learning programmes in public primary schools

Table 4.11 below shows the need of financing e – learning programmes.

Statement	Frequency		Total
	Yes	No	
Financing of e – learning programmes	111 (66%)	58 (34%)	169 (100%)

Source: Survey data

From the results of study shown in table 4.11 above indicate that 111 (66%) respondents said schools require financing in order to run e – learning programmes effectively against 58 (34%) who did not agree.

Implementation of the new programme depends on the training capacity of teachers and how they are readily prepared to receive the new programme. The preparedness also lies in the provision of quality learning resources and facilities. The process is costly and needs more effort to ensure funds are available. Purchasing of equipment and renovation of the existing physical facilities require a lot of funds that the government should provide in the form of budget allocation or grants from donors in private sector. Eicher (1984) says that concerning quality of education it must be seen in the light of monetary indices such as expenditure per pupil focusing on teacher-pupil ratio in terms of learning and teaching resources.

4.5.3 Stakeholders' sensitization on e – learning programmes in public primary schools

Table 4.12: Stakeholders sensitization on e – learning programmes

Table 4.1 below shows responses from teachers about stakeholders' sensitization.

Group	Frequency		Total
	Yes	No	
Class teachers	74 (44%)	95 (56%)	169 (100%)

Source: Survey data

From the results in the table 4.12 above, the study reveals that 95 (56%) class teachers as respondents said sensitization to the stakeholders has not been done against 74 (44%) who agreed. It is evident that sensitization programmes should be carried out to the stakeholders because their participation in school development is crucial. All stakeholders are required to be involved in training schedules and public awareness through media, seminars and workshops which require financial consideration. MOEST (2005) report says that strengthening of delivery of education in primary schools needs an increase of financial expenditure on formal education. The task of implementation also involves persuading people to change their attitudes. Respondents were asked to state if public awareness had been done to school community.

4.5.4 Installation of electricity in public primary schools

Table 4.13: Installation of electricity in public primary schools

Table 4.13 below shows information on availability of power in public schools.

Statement	Frequency		Total
	Yes	No	
Installation of electricity in primary schools	36 (21%)	133 (79%)	169 (100%)

Source: Survey data

From the results of study in table 4.13 above, 133 (79%) respondents said that schools do not have electricity against 36 (21%) who agreed that public schools had electricity.

Implementation of e – learning programmes cannot be achieved without installing electricity to run the computers. Installation of electricity requires funds and given high poverty index in rural communities, public schools are not able to shoulder the cost. The government should provide funds to install power in public schools. Alternative sources such as Constituency Development Fund (CDF) should be used to supplement government effort. Osei (2006) argues that clarity and achievement of an education programme can be done through the basic nature of the subject and a provision of appropriate facilities.

4.5.5 Management support for e – learning in public primary schools

Table 4.14: Management support for e – learning

Table 4.14 below shows the degree at which school management offers to support e – learning programmes.

Statement	Frequency		Total
	Yes	No	
Management support for e – learning	16 (9%)	153 (91%)	169 (100%)

Source: survey data

The results in the table 4.14 above reveal that out of 169 (100%) respondents, 153 (91%) said the school management did not support e – learning programmes against 16 (9%) who agreed that school management supported. This is a challenge because management is the hub of school development and should show its commitment to curriculum policies and advise accordingly as an administration instrument. Effective implementation of innovation is a process achieved through practice. Clarity and awareness are critical factors that teachers and other stakeholders require to have in mind in order to see the need for change. Teachers and trainers are required to be well prepared for innovation through sensitization in seminars and workshops.

It is important for them to understand the basic nature of the system, its objectives, instructional resources, facilities and educational procedures. The new educational programme requires relevant and adequate resources for a successful implementation process to take place. Nana (2000) argues that quality education is attained through provision of inputs or resources in the form of funds, equipment, facilities, teachers and learners. The provision of relevant facilities is important to make people literate and

numerate in acquisition of technical and vocational skills necessary for a sustained economic growth.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter the study has specifically summarized the findings by each objective and provides conclusions and recommendations for further study.

5.2 Summary of the findings

5.2.1 Objective one

The first objective of the study was to assess physical structures available to facilitate the use of e – learning in public primary schools. Based on the findings of the study given there are no appropriate physical infrastructures in public primary schools to ensure smooth implementation of the programme. The structures require rehabilitation in order to have effective implementation. The schools do not have sufficient funds for construction of computer laboratories. There is high poverty index among rural communities in Emuhaya Subcounty and even in the past it was very difficult for local schools to organize fundraisings for construction of decent classrooms.

5.2.2 Objective two

The second objective was to assess quantities of electronic hardware and software available in public primary schools. Lack of computers, laboratories and guidelines in schools are identified as impediments to implementation of e – learning programmes. It poses a hindrance to teachers who have trained in ICT and may not practice it.

The computer is capable of transforming teaching and learning into a learner-centred process which nurtures cognitive and psychomotor skills. Government should avail funds for e – learning programmes. The costs of sophisticated equipment like computers and the accompanying costs of installing electricity makes the programme look expensive to be

shouldered by primary schools. The integration of ICT in schools is an ideal way of improving and reforming the traditional curriculum process. In education, it is seen as a way of promoting educational change, improvement of skills of learners to prepare them for information society. Lack of e – learning infrastructure in schools contributes to the limitation of accessing the new technology. Teachers may act the change for technology in education and it is essential the basic ICT skills be taught in pre-service and in-service courses in teacher training colleges. Braak (2001) asserts that ICT usage fosters collaborative learning, increased flexibility and accessibility to education.

5.2.3 Objective three

The third objective of the study sought to assess teacher preparedness in terms of knowledge, attitudes and skills for presentation of e – learning in public primary schools. Some teachers are overcome with fear to have hands-on the equipment. It is a phobia that an individual has over objects and it may take a long time to convince such people to get basic training skills in ICT.

They said that they are used with the conventional system and see no need of acquiring ICT skills. The study reveals that due to that resistance, it is difficult to achieve technological accessibility, convenience and economic advantages of e –learning as the key drives for implementation. Teachers require sufficient time to prepare for integration into the new system of instruction.

They need to learn how to manipulate equipment and browse information on the internet. The internet is an attractive medium for searching and obtaining information because it is relatively cheap and conveniently fast. To address the problem teachers need encouragement through pre-service and in-service training.

5.2.4 Objective four

The fourth objective was to determine challenges implementers of e – learning are likely to face in public primary schools. The respondents encountered challenges such as computer illiteracy and phobia, lack of computers and e – learning classrooms, lack of electricity, financing of e – learning programmes, sensitization of stakeholders, accessibility and time for training, old age and attitude.

5.2.4.1 Computer illiteracy and fear of change

The results of study in table 4.6 reveal that over (50 %) public primary teachers are computer illiterate and have phobia to handle computers. This is confirmed by 115 (68%) who indicated that they have never operated a computer in their lives. Experience is a very important factor in teacher quality.

Manipulative skills can improve the quality of a teacher and reduce the phobia that affects their attitude. Leadership of schools did not organize compulsory training sessions for staff to attend during school holidays. Such opportunity could have been used to eliminate illiteracy and phobia. The teachers could have been encouraged to attend nearby e – training institutions, seminars and workshops. This information is supported by Muindi (2010) who says that nearly half of teachers in public schools are computer illiterate. It poses a challenge to implementation of e – learning programmes.

5.2.4.2 Resistance due to overreliance on conventional system

Teachers' overreliance on conventional system affects them and sees no need of change. The results of study in figure 4.1 reveal that due to that resistance, only 49 (29%) respondents attended seminars. It is difficult to achieve technological economic advantages of e – learning as the key drives for implementation if the status-quo remains. Due to lack of training and familiarity teachers' attitude is affected. The same sentiment is reported by Wentling (2000) who argues that the largest challenge to integrating e – learning with

knowledge management is the traditional reliance of training. Teachers must be given enough exposure to computers. However, Edelson (2001) says that increasing the number of computers in the classroom is very dynamic and interactive.

5.2.4.3 Creating awareness about e – learning programmes

The results of study reveal that parents and school community are not aware of e – learning programmes. Out of 169 (100%) class teachers, 95 (56%) respondents said that parents and school community have not been sensitized on e – learning programmes evidenced in table 4.13.

There were 25 (100%) head teachers interviewed and 22 (88%) respondents said that parents do not have knowledge about the programme due to ignorance and lack of exposure. Due to high illiteracy level among the communities, there is limited access to the new e – systems and apparatus making them not sensitive to the changing world. There are demands of managerial education with a view of reinforcing a mentality of change and sharing of knowledge with the community. The purpose is meant to re-engineer the minds of people to facilitate the planning of strategies based on common objectives and goals.

5.2.4.4 Accessibility and time for training

Teachers require sufficient time to prepare for integration into the new system of instruction because they need to learn how to manipulate equipment and browse on the internet. The internet is an attractive and conveniently fast medium for searching and obtaining information. The results of study in table 4.4, reveal that 78 (46%) respondents said their schools have ICT trained teachers but their training skills cannot be put into practice due to lack of computers. They also pointed out that lack of commitment and time affect creativity and motivation. They do not have access to equipment, hence makes them have negative attitude towards e – learning.

Development Collaborative e – learning Technologies Initiative which depends on internet can be introduced in rural areas to help teachers acquire ICT training. The system is able to create interpersonal communication and increase of knowledge. This information is found important because Goodridge (2001) explains how it can work as a web-based training technique. He says that e – learning blends well with classroom because it is dynamic. Bajah (1998) concurs with him by saying that the quality of any education is judged by the effect it has on learners and society.

5.2.4.5 Old age and attitude

The results of study in table 4.6 reveal that 157 (93%) respondents indicated they are interested in e – learning and only 1 (1%) respondent said due to old age she cannot cope with ICT technology. There is still a gap in the quality of computer use which needs to be addressed and provision of teacher education as a fundamental tool in technology be looked into. It is important to understand and appreciate ICT integration in teacher education as a catalyst of change.

The gap in the quality of computer use can be filled by application of Computer Practice Framework (CPF) in primary schools to provide expanded framework of holistic evaluation of ICTs in teacher education. This can be achieved if the school management sends a proposal to the Constituency Development Fund (CDF) for funding of computers and modern e – learning classrooms.

5.2.4.6 ICT policy Implementation

The innovation requires a lot of commitment to implement for effective transformation. The study reveals that a policy to guide integration of ICT programmes in primary schools has not been used. Curriculum managers are supposed to ensure IT objectives and the set targets are achieved at school level. Inappropriate quality of electronic hardware and software experienced in schools is an indication of weakness or lack of IT management staff. The greatest factor is availability of funds and training of ICT personnel for success to be realized. The programme is affected by lack of appropriate facilities in schools. The school management should put stringent measures in place for maintenance of equipment and provision of funds to run programmes. That may help the government to appreciate performance of management and realization of vision 2030. Before buying computers the hardware-software interface need to be considered to avoid chances of any mismatch.

Tear and ware of machines is terminal and it is important to note that repairs may not be necessary but whole replacement of equipment. This is also echoed by Jackson (2004: 23) who maintains that to remain competitive check on part suppliers is necessary because they often introduce new parts or products and discontinue older parts.

5.3 Conclusions

Arising from the research findings it is evident that lack of appropriate inputs poses a hindrance to the implementation of e – learning programmes in Emuhaya Subcounty. The Ministry of Education through Kenya Institute of Curriculum Development (KICD) should rise to the occasion and reverse the trend by ensuring that public schools receive adequate resources for e – learning. The curriculum developers at the institute need to redesign the incorporation of the new approach into educational system.

School leadership which has failed to organize training sessions during school holidays should revive the programme and proceed to give teachers the opportunity for training. The policy to guide integration of ICT programmes in primary school educational curriculum is not functioning. The trend should be reversed. Banathy (2000) argues that there is need for persistence, patience and collaboration among stakeholders to pursue a common vision agreed upon.

Failure to have objectives and targets to be achieved at school level by IT managers is identified as a setback to the process of implementation. Inappropriate provision of hardware and software equipment in primary schools poses a problem while IT management staff in primary schools does not play its role as required. There are no stringent measures put in place to provide maintenance services to equipment. Lack of funds for ICT instructional programmes is cited as a problem and it has hindered the progress of implementation. The planners do not have a foresight of challenges to implementation of e – learning. The other problems noted are lack of management support and teachers' commitment to the new innovation.

There is no serious consideration for e – learning technology by stakeholders. Time for teachers to train which play a pivotal role in implementation has not been considered. E – learning centres and establishment of e – learning standards and specifications as initiatives to bring change should be created. These are educational and training initiatives supportive of new educational programme.

The other impediment is the inability to access the new technology due to teachers' negative attitude and resistance. Teachers must go for ICT training to be effective in knowledge-based technology. Continuous training for teachers is necessary to acquaint

them with emerging issues in class management, curriculum and instructional implementation in their respective subject specialization. Coleman (1996) argues that the critical element of an effective pupil learning is a function of the quality of the teacher. It is noted that stakeholders' sensitization which play a crucial role in the development of curriculum has not been done in schools. Preparation of all stakeholders involves training schedules and public awareness through media, seminars and workshops. There is need to carry out rehabilitation of the existing structures to ensure success is achieved in the implementation of e – learning.

Clarity and awareness are also critical factors that affect effective implementation of an innovation. Consultations with experts and more research are needed to find adequate information about problems affecting implementation of e – learning. It is important to address the issue of funds in the exploitation of the programme because the money is needed to purchase equipment and sustain the project.

The problems of e –learning in public primary schools may lie with appropriation and distribution of these funds. To assist the situation objectives of e – learning must be followed in order to have meaningful results. This study finds information in the report by Osei (2006) very useful because it explains what ought to be done in any curriculum primarily to establish objectives and adding ways of achieving them.

5.4 Recommendations arising out of the findings

Arising from the findings of the study the following recommendations are made in order to ensure a successful application of e – learning in public primary schools. The UNESCO (2002) report on teacher education must be implemented. The report focuses on teachers' practices and knowledge of curriculum. They are required to acquaint with communicative

skills potential of ICTs for demonstration of their competence. To realize the objectives, primary schools should prepare resources in terms of ICT personnel, physical structures, electronic hardware and software. There is high demand for appropriate quality physical structures to support e – learning in public primary schools. The government should provide funds through the budget allocations and ensure schools acquire modern computer labs with supply of electricity. Schools may also send proposals to CDF for funding of computers and modern e – learning classrooms. Security to curb theft and vandalism of equipment should be provided. The Ministry of Education should introduce clusters of e – learning centres with instructors to man a group of schools. These centres can be used for training teachers from nearby schools. It is easier and cheap in terms of transport costs and also it is convenient. The private sector which plays a significant role in the development and growth of economy should be encouraged to support the initiative by donating funds to equip schools with computers.

5.5 Suggestions for further study

- A similar study should be conducted in other districts in Kenya to establish preparedness of public primary schools in the implementation of e – learning programmes.
- Consultations with experts should be carried out to find more information about problems in the implementation.

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APPENDIX I

QUESTIONNAIRE FOR CLASS TEACHERS

School

Tick on one in the brackets: Male () female ()

Information in this questionnaire will be treated confidentially for research purposes only.

Answer all questions in your own opinion and feelings about e – learning.

KEY: 1 – Strongly Agree, 2 – Agree, 3 – Undecided, 4 – Disagree, 5 – Strongly Disagree

For questions **1 – 7**, put a tick (√) in the parenthesis to indicate how closely you agree or disagree.

1. Computers are available in school.....(1) (2) (3) (4) (5)
2. E – learning classrooms are available in school.....(1) (2) (3) (4) (5)
3. There is adequate security in school(1) (2) (3) (4) (5)
4. There are ICT trained teachers in school.....(1) (2) (3) (4) (5)
5. There is electricity in school.....(1) (2) (3) (4) (5)
6. E – learning programmes need funds(1) (2) (3) (4) (5)
7. Stakeholders’ sensitization for e – learning has been done(1) (2) (3) (4) (5)

8. Current instructional methods make syllabus coverage faster than e – learning.

(Tick on one in the parenthesis)

a. () Yes

b. () No

For questions 9 – 13, state how often you use the instructional methods. Write your preferred number in the parenthesis.

(1 – Never, 2 – Least, 3 – Sometimes, 4 – Most)

9. Discussion ()

10. Radio ()

11. E – learning (computer) ()

12. Question and Answer ()

13. Field Trips ()

Answer questions 14 – 18, by crossing a number of your preferred choice using the key provided below. eg, 1 2 3 4 5

KEY:

1 – Extremely dissatisfied 2 – Dissatisfied 3 – Neutral

4 – Satisfied 5 – Extremely satisfied

State how satisfied you are with:

14. Community support for e – learning in the school1 2 3 4 5

15. The quality of physical structures in the school1 2 3 4 5

16. Number of ICT trained teachers in the school1 2 3 4 5

17. Class enrolments1 2 3 4 5

18. The general status of school learning resources1 2 3 4 5

Answer questions 19 – 25. Put a tick (✓) in the parenthesis for the right response of your opinion

19. Have you ever attended ICT training for handling an e – learning lesson?

a. () Yes

b. () No

If yes, how many times have you attended e – learning seminars?

a. () once b. () between two and five times c. () between six and ten

times

20. How many computers does your school have? Write number in the brackets. ()

21. What is the quality of computers in your school? Tick on one in the brackets.

a. () New and functional

b. () Old and not maintained

c. () New but not functional

d. () No computer in the school

22. Have you ever handled a computer? a. () Yes b. () No

If no, what has been the problem?

.....



APPENDIX II

RESEARCH STUDY PUBLIC PRIMARY SCHOOLS IN EMUHAYA DISTRICT PILOT AND RESEARCH STUDY PUBLIC PRIMARY SCHOOLS DATA COLLECTION

Topic: Public primary schools preparedness in the implementation of E-learning programmes in Emuhaya District.

PILOT STUDY PRIMARY SCHOOLS

	SCHOOL	TQ/NO	HQ/NO
1	JEPTULU	1-7 PC	15HP1
2	SHIPALA	8-14PC	16HP2

RESEARCH STUDY PUBLIC PRIMARY SCHOOLS IN EMUHAYA DISTRICT

	SCHOOL	TQ/NO	HQ/NO
1	EMUSUTWSI	RC 1-7	176 HR
2	MWITUHA	RC 8-14	177 HR
3	EMUHONDO	RC 15-21	178 HR
4	EBUKHULITI	RC 22-28	178 HR
5	ELUHOBE	RC 29-35	179 HR
6	ESIBUYE	RC 36-42	180 HR
7	EBUSIRATSI C.O.G	RC 43-49	181 HR
8	EBUKHAYA	RC 50-56	182 HR
9	MUNDICHIRI	RC 57-63	183 HR
10	EMMUKUNZI	RC 64-70	184 HR
11	ESIRABE	RC 71-77	185 HR
12	IRUMBI	RC 78-84	186 HR
13	EBUSIRATSI A/C	RC 85-91	187 HR
14	WEMILABI	RC 92-98	188 HR
15	EBBIBA	RC 99-105	189 HR
16	EMUHAYA	RC 106-112	190 HR
17	IBUBI	RC 113-119	191 HR
18	WANAKHALE	RC 120-126	192 HR
19	KIMA	RC 127-133	193 HR
20	EMMUNWA	RC 134-140	194 HR
21	EBUSAKAMI	RC 141-147	195 HR
22	EMUTSURU	RC 148-154	196 HR
23	MUMBOHA	RC 155-161	197 HR
24	ITUMBU	RC 162-168	198 HR
25	ESIANDUMBA	RC 169-175	199 HR

Table 1: List of pilot and research study public primary schools

Source: District Education Centre

Research Authority: National Council for science and Technology (NCST) Ministry of Higher Education Science and Technology (MOHEST) Permit No, NCST/RCD/14/012/1292.

Moi University Student's Reg No.: EDU/PG/EDH/1008/10 (M.Phil) Education

APPENDIX III

PERMIT FROM NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471,2241349
 254-020-310571,2213123, 2219420
 Fax: 254-020-318245,318249
 when replying please quote
 secretary@ncst.go.ke

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

Our Ref:

NCST/RCD/14/012/1292

Date:

20th September 2012

Dishon William Opati
 Moi University
 P.O.Box 3900-30100
 Eldoret.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Public primary school preparedness to the implementation of E-learning programmes in Emuhaya District,*" I am pleased to inform you that you have been authorized to undertake research in **Emuhaya District** for a period ending **30th July, 2013**.

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

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

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

Copy to:

The District Commissioner
 The District Education Officer
 Emuhaya District.

FRIENDS SCHOOL KAIMOSI BOYS,

P.O.BOX 103 – 50309,

TIRIKI.

20 – 5 – 2013.

THE CHAIRPERSON DEFENCE BOARD,

THROUGH THE DEAN,

SCHOOL OF EDUCATION,

DEPARTMENT OF CURRICULUM INSTRUCTION AND EDUCATIONAL MEDIA,

MOI UNIVERSITY,

P.O.BOX 3900 – 30100,

ELDORET.

Dear Sir,

RE: INTENT TO SUBMIT THESIS FOR DEFENCE

I hereby request to submit my thesis for defence. The topic is ‘**Public primary schools preparedness in the implementation of e – learning programmes in Emuhaya District Vihiga County**’. My supervisors are Prof. Chris Mukwa and Prof. John M. Boit. They have gone through my work and are satisfied it is ready for presentation. I am an M. Phil Education student **Reg. No. EDU / PG / EDH / 1008 / 10**. I would be grateful for your consideration. Thank you in advance.

Yours Faithfully,

Dishon William Opati

Sign.....

MOI UNIVERSITY**MASTER OF PHILOSOPHY IN EDUCATION (M. PHIL)****COURSE CODE : PSY 818****COURSE TITLE : PSYCHOLOGY OF EXCEPTIONAL PERSONS****TASK : DESCRIBE THE OBSERVED BEHAVIOURS OF
CHILDREN WITH SPECIAL NEEDS
(EXCEPTIONAL CHILDREN) IN YOUR
INSTITUTION (CAT 1).****PRESENTER : DISHON OPATI WILLIAM.****REG NO. : EDU/PG/ EDH/ 1008/10****COURSE LECTURER : DR.KIMANI****DATE : AUGUST, 2010****CAT 1**

Describe the observed behaviour of children with special needs (exceptional children) in your institution.

EXCEPTIONAL CHILD

Definition

This is a child who differs from the average or normal child in mental characteristics, sensory abilities, communication abilities and social behaviour. The abilities and behaviour are unique as well as his or her psychological and physiological make-up. Because of the above, he or she requires professional treatment and handling. The uniqueness is in terms of performance, appearance and emotional states. The child is usually with restlessness, anxiety and may not be responsive. The child needs special care treatment.

Introduction

The observable characteristics of behaviours of exceptional children depend on the nature of their disabilities and handicappedness.

Disability is any physical, social or psychological limitations caused by an injury or genetic makeup. Handicap is a barrier which the handicapped person must surmount in order to attain the fullest physical, mental, social, vocational and economic usefulness of which he is capable of.

The differences must be to such an extent that the child requires the modification of school. Children are considered to be educationally exceptional only when it is necessary to alter the education programme.

In education the exceptional children can be grouped into those with.

- i. **Intellectual differences.** This group includes the learning disabled (LD), gifted and talented (GT) mentally handicapped (MH) and mild.
- ii. **Communication differences.** These are those with speech and languages impairment and learning disabled (LD).
- iii. **Sensory differences.** These are those with visual and auditory impairment.
- iv. **Behavioural differences.** These are the emotionally disturbed or socially maladjusted.
They include the juvenile delinquency (young people or adolescents).
- v. Multiple and severe handicapping conditions include children with a combination of several impairment conditions such as MH.
- vi. **Physical differences.** These are children with non – sensory handicappedness e.g. lame or cripples.

Observed behaviour of children with special needs.

In primary schools the behaviour of children with special needs can be observed using indicators such as grooming, behaviour disorder, shy and withdrawn, overtly aggressive, birth order, emotionally unstable or short tempered, rowdy, isolates and over socialize.

- **Grooming.**

This is the manner in which children dress themselves. Some may be untidy with unkempt hair or even unwashed clothes which can be perceived as indiscipline. The teachers should find out more about the back ground of the learner such as broken homes, low social economic status, and neglected family, destitute or orphaned families.

- **Behaviour disorder**

This is an indicator in which children exhibit extremely inappropriate behaviour and may be perceived as grossly indisciplined. Parental practices of rearing children and patterns or life styles adopted by parents may sharply influence a child's behaviour. Such children may come from care free homes, broken homes, families with poor role models, or peer group influence or pressure, poor relationship with parents and exposure to bad or poor values.

- **Shy and withdrawn.**

Lack of exposure and interaction due to very restrictive family tendencies may affect development and growth of children's behaviour. This may lead to extremely shy and withdrawn children. The condition is also an indication of the past experiences and cultural control that a child may have passed through. These children take back seats in class and tend to avoid a teacher's eye contact lest they be asked questions.

- **Aggressive**

We have children who are overly aggressive or hostile, bully and tease by beating others from which they derive pleasure. These tendencies may be due to early childhood experiences acquired or growth of a child in homes with extreme domestic violence. The behaviour may also be due to training of an individual in the phallic stage, as adopted by the theory of Sigmund Freud.

- **Birth Order.**

Research studies indicate that the birth order of an individual at times plays a significant role in the development of behaviour. Certain disorders are displayed by children who were born as only children in families and experience no rivalry for parental attention, love and care. Such children exhibit etiological factors like short tempered or emotionally unstable acquired in traumatizing and frustrating experiences.

- **Rowdy.**

Exposing children to a lot of freedom especially by permissive parenting care is a poor precedence in a child's behaviour development. Permissiveness or Laissez Faire (no-order culture) more so from a poor family makes children rowdy because they believe parents will not punish them for their wrongs. Rowdy children are mainly seen in lower classes and middle primary. Some of them are quick to defend themselves especially the extroverts.

- **Isolates**

These ones appear nearly in all levels of classes. They prefer to be alone and have speech and language problems (communication disorders). They also take back seats in class. Some exhibit low intellectual capacity and motor deficiencies. They come from isolated families, lack parental love or care and have low self-esteem. They tend to repeat several classes and as a result are over grown in body size. They are also shy and withdrawn. Some of them have exhibited low sensory or auditory responses during instruction. They are not active in class even outside in outdoor activities but socialize with children or peers of their caliber.

- **Over – socialize.**

Diversity of behaviour for children in school is a natural endeavour. When a child is born he or she is a tabula rasa and his or her character will be largely influenced by environmental factors apart from the genetic and congenital effects. The family is a major force that influence the exceptional child, it is critical especially the parenting styles adopted. Children who over – socialize derive their observed behaviour from the influence of such styles.

Characteristics of exceptional children.

Children with special needs display diverse characteristics which are important in educational management to adjust to their challenges.

Their behaviour is a reflection of special needs deficiencies that require urgent educational management therapy or intervention. They are those abnormalities that require professional attention by teachers, parents, or counselors because they have expertise of handling psychological and physical maladaptive behaviours.

- **Physical characteristics.**

Body structures may be extra ordinary and such physical characteristics contribute to their observable individual differences. Tall and huge in physique are presumed normally generous and humble. Some are obsess and sensitive to their physical structure. In case of genetic abnormality, such individual may exhibit hostile aggression. Short people or dwarfs always are expected to be harsh and emotional.

- **Grooming characteristics:** Reflect the up – bringing of the child in the family. Their personal hygiene and socialization are indicators in behaviour development.

- **Health and medical characteristics.**

These are children in the school due to their health conditions exhibit nose bleeding, convulsions or fists. They require regular check- ups, conducive health management and interaction.

- **Security and Nutritional characteristics.**

Some children when observed keenly will indicate their desire for mental stability and assurance beside care for by their parents. The provision of food in a balanced diet and adequate ration is a pr-requisite of nutritional requirements. Most children in primary school are malnourished and as a result suffer from problems of imbalanced diet and food inadequately due to rampant poverty in the community. There was a jigger manacle which attacked children but the ministry of health personnel intervened and the problem subsided. Parental negligence and community in sensitization contributed to the fast expansion of the jigger menace.

- **Intellectual characteristics.**

There are children that have very superior abilities (the gifted and talented) while there are others intellectually inferior. Under teaching or over teaching such children can be problematic because of unreached or overstretched needs and abilities.

For example, if the intellectually inferior children are not given remedials they may lag behind the rest and in turn affect their self – esteem.

The gifted and talented children:

May need to be stimulated academically. Some children with special abilities or talents which have not been discovered may be problematic to the extent of being stubborn and truants, hence frustrating the child even more.

These mental challenges occur more frequently in the school and therefore it is recommended that teachers use the intriguing problems to the maximum. Proper equipment, teaching methods and approaches should be used.

The gifted and talented children give evidence of high performance capability in intellectual areas such as creative, artistic or leadership capacity or specific academic fields. They require services or activities not ordinarily provided by the school in order to develop those capabilities fully. Although it is agreed that intelligence is inherited the environment in which a child grows plays a major role in determining intelligence. Factors such as level of interaction, nutrition and environmental stimulation play a role in intellectual performance and achievement. Children who are gifted are generally healthy, popular and emotionally adjusted, contrary to popular belief that they are anti-social, timid, in poor health, pre-occupied and dependent. Their cognitive domain is superior. They ask many questions and are not satisfied with simple answers. They have excellent memory of numbers and symbols, read very early and way above their age-mates, have good reasoning ability, understand quickly and have a strong vocabulary.

Social and emotional domain: They are leaders in many social situations, enjoy decision making and assume responsibility for the group. They are co-operative and adjust quickly, have good sense of humour, quick to point out inconsistencies in situations, sensitive to the needs of others, have advanced level of moral behaviour and sense of justice. They maintain positive self image and a high level of self – awareness. They are emotionally independent and stable.

Physical domain: Gifted children are physically disadvantaged over other children. Researchers have actually found through longitudinal studies that gifted children tend to be slightly stronger and larger and healthier than the norm, identification of gifted children is done through the administration of psychometric tool which include intelligence tests, achievement tests, aptitude tests, creativity measurers and other specialized tests.

Mentally retarded

Children with mental retardation may be mild, moderate or severe. Mental retardation refers to significantly subverage, general, intellectual function resulting or associated with concurrent impairment in adaptive behaviour and manifested during the developmental period which adversely affects a child's educational performance. In determining the severity of retardation assessment aims at the issues that discriminate retarded children from normal children looking at the rate of learning (slow learning), level of learning (limited learning), rate of forgetting (high) transfer of learning difficult, use of concrete versus abstract learning, incidental learning (informal settings, sudden learning, spontaneous, quick and fast) and insightful learning.

Learning disabled

Children in the school exhibit specific learning disability or disorder in one or more of the basic psychological processes involving understanding or using language (spoken or written) that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or perform arithmetic calculation. The term includes such conditions as perceptual disabilities, brain damage and minimal dysfunction. This does not include official hearing or motor disabilities. The learning disabled primarily cannot read to

understand information, have speech and language problems, cannot do simple calculations of mathematics, writing problems and spelling, cannot concentrate or answer questions precisely. They have socialization difficulties, low frustration tolerance, poor impulse control and self –concept, poor attention and gross motor development.

Emotional and Behavioural Disorders.

In the school children with such needs exhibit emotional disturbance a condition lasting along period of time and to a marked degree.

They exhibit tendencies of inability to learn that cannot be explained by intellectual, sensory or health factors, inability to build or maintain satisfactory interpersonal relationships with peers and teachers, inappropriate types of behaviours or feelings under normal circumstances, a general pervasive of unhappiness or depression, and a tendency to develop physical symptoms or fears associated with personal or school problems. Behavioural lists argue that emotional and behavioural disorders are caused by environmental events and / or antecedents and may be consequences of behaviour.

Psycho-analysts see these disabilities as effects of interactions between the child and significant others on personality development and resolution of internal conflicts. Sociologists see these disabilities as resulting from breaking of rules that govern social interactions. Ecological theorists look at these disabilities as a mismatch between the child and the environment.

Teachers as professionals should assist these children with special needs. Some may be disturbed seeking acceptance from significant others. Some seek recognition i. e. need for belongingness, appreciation e.t.c. Some need company, want to enjoy the company of others who may not be interested, need recognition of achievement by receiving either tangible or intangible rewards.

Adolescents with Disabilities

There is greater need to focus on adolescent with disabilities because these add to the normal emotional and psychological difficulties of adolescence. There is need to adjust the educational and social programme to fit their circumstances. The adolescents need to acquire the following personal and social behaviours to help them function successfully in society and on the job.

Be able to establish eye contact if required by the situation.

- Demonstrate respect for others and their property.
- Be attentive to authority figures appropriately.
- Exhibit good manners.
- Use appropriate manners.
- Discriminate between behaviour with respect to time and place.
- Achieve a reasonable balance of dependence and independence.
- Learn to accept and follow the work schedule established by the school or institution.
- See a task through to its completion.

There is need to provide sex education to adolescents in order to reduce the danger of closing up and never expressing their sexuality. They have a right to be educated on

their sexuality in order to live fulfilled lives. Further, there is need to provide elaborate career education because it begins from primary years and extends throughout school. It helps to focus training in specific technical skills in developing their potential attitude towards work.

Identification Strategies of Exceptional Children.

Observation of the overt manifestations will quickly reveal their behaviour patterns. Teachers should observe their physical needs such as red eyes which may indicate abuse of drugs or does not sleep at night, grooming and level of attention in class that seem to decline, patterns of interaction or socialization. The teacher can also investigate the medical and health records or history, special check –ups and intervention. Extend the investigation to children with intellectual needs; observe if the child is quick or slow in responding or self – expression.

Objective observation can also be made in student’s reactions to provocation, use of language, handwriting reflection or carelessness, temperamental (habituation), relationship between cognitive and dexterity. The slow learners may exhibit the nature of origin of the learner, ethnicity, parenting, environment, activity level and emotions. The results may also categorize some children into groups such as the genius, average, intelligent or idiots. A good method is also to interview the children for their sociability and psychological maturity.

Child with low vision

We have this type of children and are common in nearly all levels of learning upper and lower primary. There are many ways they exhibit their disability in class. These include:-

- Complaining of too much light, not seeing well.
- Read and write with head tilted.
- Books are held very close or far from eyes.
- Have difficulties in grasping the subject matter.
- Over- estimates the distance.
- Eyes not fixed.
- Hear comments from other classmates.
- Poor balance when walking.
- Difficulties in reading and writing.
- Difficulties in attainment of concept.
- Difficulties in motor development.
- Affected in speech and language development, e. g, articulation errors resulting in faulty production of the phonemes, distinctive sounds of language – substitution errors, distortion of phoneme such as stuttering and chattering are exhibited.
- Slow in acquiring knowledge.
- Common problem in behaviour blindness.

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ABSTRACT**PUBLIC PRIMARY SCHOOLS PREPAREDNESS IN THE IMPLEMENTATION OF E – LEARNING PROGRAMMES IN EMUHAYA DISTRICT VIHIGA COUNTY**

The purpose of this study was to investigate public primary schools preparedness in the implementation of e – learning programmes in Emuhaya District. The district is in Vihiga County, Kenya. Four specific objectives guided this study to establish the physical structures available to facilitate e – learning, quantities and quality of electronic hardware and software available in schools, teacher preparedness and existing challenges which implementers were likely to face. The study employed an ex-post facto design with Critical Success Factors (CSFs) theory designed by Freund (1998). The population of the study was 1044 teachers from 83 public primary schools, figure obtained from District Education Office in Emuhaya. Simple random sampling method was used to select 25 (30%) public primary schools from 83 schools in the district. The sample comprised 25 head teachers and 175 class teachers as respondents from middle and upper primary classes. Eight teachers were randomly selected from each of the twenty-five schools said above. Questionnaires were used to collect data from respondents and presented in the form of frequencies and percentages for the purposes of analysis. Inferential statistics were used to analyze data. Chi-Square(x^2) was used to test relationships between variables. Spearman's rank correlation was used to test the null hypothesis. The study revealed that 95% of public primary schools did not have computers and 79% had no electricity. The results also revealed that 73% of teachers in public schools probably never handled an e – learning lesson and had negative attitude towards the new technology. The study recommends that implementation of e – learning programmes requires adequate provision of

teaching and learning resources. Teachers' engagement with materials from the internet needs the competency on how to use the new technologies effectively in the classroom for the benefit of the learners. Since e – learning is uniformly standardized, it is important to note that implementation of the innovation would eliminate excessive reliance on traditional methods of instruction. A paradigm shift in education would be created focused on integrated instructional approaches. This study would be found useful to policy makers and primary school teachers.

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THESIS PRESENTATION
Summary

**PUBLIC PRIMARY SCHOOLS PREPAREDNESS IN THE
IMPLEMENTATION OF E – LEARNING PROGRAMMES IN EMUHAYA
DISTRICT VIHIGA COUNTY**

- 1) What did you research on? - TOPIC
- 2) How did you do it? – METHODOLOGY
- 3) What were your findings?
- 4) Conclusion
- 5) Recommendation

1. INTRODUCTION

- **TOPIC:** Public primary schools preparedness in the implementation of e – learning programmes in Emuhaya District Vihiga County
- Research Authorization: 20th September 2012
- Supervisors: Prof. Chris Mukwa
Prof. John M. Boit

CHAPTER ONE

2. Specific objectives of the study

- To identify the physical structures available to facilitate the use of e – learning in public primary schools in Emuhaya District
- To identify the quantities and quality of electronic hardware and software available in public primary schools
- To determine the teacher preparedness in terms of knowledge, attitudes and skills for presentation of e – learning in public primary schools
- To discuss the existing challenges which implementers are likely to face in public primary schools

3. **Research questions:** Four research questions were developed from the specific objectives
4. The purpose of the study was to investigate public primary schools preparedness in the implementation of e – learning programmes
 - **Significance of the study:**
To provide information useful to practicing professionals, educationists, academic and policy makers
 - **Justification of the study:**
To provide information on factors that would make implementation succeed to improve education system and realize Vision 2030
 - **Scope of the study:**
Teachers from class 4 to class 8 and headteacher were used
5. **The statement of the problem:**
 - Focused on the availability of e – learning physical structures and ICT equipment in public primary school for smooth implementation
 - Teacher preparedness in terms of competence to use computers
 - Theoretical framework:
Based on CSF_s by Freund (1998) on e – learning with display of Conceptual framework of all objectives

CHAPTER THREE

6. Research design

- Ex-post facto design was employed
- Information based on inferences, hence used inferential statistics

7. Area of study

Emuhaya District: Luanda Zone had 46 public schools and Emuhaya Zone 37 schools

8. The study population

Target population was 1044 trained primary teachers from public schools

9. Sampling procedures

Simple random sampling was used to select 25% (30) schools from 83 public schools (Appendix IV page 99)

10. Sample size

- Selected 200 teachers as respondents
- 8 teachers were selected from each school

11. Data collection instruments

Used class teachers' questionnaire (Appendix I page 93)

Headteachers' questionnaire (Appendix II page 97)

12. Data collection procedures

- Questionnaires were personally delivered to respondents in their schools
- Completed questionnaires were collected personally from respondents
- Pilot study was carried out in two schools outside the district

13. Validity

The data collection instruments were scrutinized by the supervisors to ensure that they were valid to be applied

14. Reliability

The value 0.8344 was calculated on Chronbach Alpha coefficient scale and accepted to be reasonable

$$KR_{20} = \frac{K(S^2 - s^2)}{S^2(K - 1)} \quad \text{where } K = 25, \quad S^2 = 9770, \quad \sum S^2 = 1944$$

15. Data analysis

Chi-Square (X^2) non – parametric test was employed to test the relationships between variables.

$$X^2 = \frac{(O_i - E_i)^2}{E_i} \quad E_i = \frac{\text{Total } O_i \times \text{Total } O_j}{\text{Grand Total } O_{ij}}$$

Tabulation and frequency process with data was converted into percentages 0 – 100 range

Null hypothesis was tested at 0.05 level of significance using Spearman's rank correlation test which assumes that data is measured on ordinal scale 0.7397

$$r = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} \quad \text{where } \sum d_i^2 = 598.75, \quad n = 24$$

16. Ethical consideration

- Anonymity of respondents was observed
- Safeguarding against plagiarism

CHAPTER FOUR – Findings

17. Objective One: Availability of physical structures

- 68% of public primary schools did not have appropriate e – learning classrooms such as computer labs, table 4.1 page 54
- 73% of public primary schools had low quality physical facilities, table 4.1 page 54

18. Objective Two: Quantities and quality of electronic hardware and software

- 95% of public schools did not have computers, table 4.3 page 57
- 79% of public schools did not have electricity, table 4.13 page 73

19. Objective Three: Teacher preparedness in terms of attitudes, knowledge and skills

68% of teachers were computer illiterate, table 4.6 page 63

20. Objective Four: Challenges implementers are likely to face in the programme

- Computer illiteracy and phobia, table 4.6 page 63
- Lack of computers, table 4.3 page 57
- Lack of appropriate physical structures, table 4.1 page 54
- Lack of electricity, table 4.13 page 73

- Lack of financing, table 4.11 page 71
- Lack of sensitization, table 4.12 page 72
- Lack of management support, table 4.14 page 74

CHAPTER FIVE

21. Conclusion

- Public primary schools did not have appropriate e – learning physical structures
- There were no computers in public primary schools
- Schools did not have electricity as computer source of power
- Teachers were not ICT trained hence computer illiterate

22. Recommendation

- All public primary schools should be advised to acquire appropriate and adequate e – learning physical structures, electricity and ICT trained teachers
- The programme requires financing for sustenance and maintenance services through the national budget allocation

MEANING OF ABBREVIATIONS

CPF: Computer Practice Framework

DCET: Development Collaborative E – learning Technologies (Cyber cafe)

CSFs: Critical Success Factors by Freund (1998) – Success of an organization depends on things that are needed to be done – Implementation of e – learning depends on factors which ensure operations of the system are effective

UNESCO: United Nations Education, Scientific and Cultural Organization