FACTORS INFLUENCING INTEGRATION OF ICT IN TRAINING PROGRAMS: A CASE OF KENYA EDUCATION STAFF INSTITUTE

By

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DEDICATION

To all progressive education practitioners who believe in technology-mediated pedagogical change.

DECLARATION

This project report is my original work and has not been presented for an award of a degree, diploma or certificate in any university.

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ABSTRACT

This study is examining the factors influencing ICT integration in training institutions: a case of Kenya Education Staff Institute (KESI). KESI is the capacity building unit of the Ministry of Education in Kenya. The basic research problem is that KESI, which has over 500,000 clients and a lean staff of resident trainers and Trainer of Trainers, continues to provide in-service training to the target groups through face to face methods only. This practice is very slow, expensive and no longer tenable in an institute of this magnitude (KESI Training Reports, 2008). There is, therefore, need to embrace a mixed media delivery strategy, which includes the e-Learning component, to empower the institute cover large numbers of clients during training sessions.

This study is limited to critical analysis of factors influencing ICT integration in training institutions. The research design used in this study is descriptive, cross-sectional survey, where respondents were subjected to a questionnaire and interview schedules. To ensure validity and reliability of the research instruments, a pilot study was conducted before the actual fieldwork. After fieldwork, the filled questionnaires were sorted out and classified according to groups of respondents, tallied and information collated. The categorized data was organized and analyzed by use of descriptive statistics, with the assistance of computer technology. It is expected that this study will provide a roadmap for setting up an e- Learning platform at KESI, and consequently enhance effective training delivery for Education Managers in the Education Sector in Kenya, thereby improving performance, service delivery and placement.

ABBREVIATIONS AND ACRONYMS

ADDIE -   Analysis, Design, Development, Implementation, and Evaluation

ASTD -   American Society of Training and Development

CBT   -   Computer Based Training

CD   -   Capacity Development

CEMASTEA - Centre for Mathematics and Science Teachers in Africa

F2F   -   Face to face (delivery strategy)

GSM -   Global System for Mobile Communications

GST   -   General Systems Theory

ICEM -   Induction Course in Education Management

ICT   -   Information Communications Technology

ID   -   Instructional Design

INSET -   In-service Training

KESI -   Kenya Education Staff Institute

KESSP -   Kenya Education Sector Support Programme

LAN   -   Local Area Network

MoE -   Ministry of Education (Kenya)

M-pesa -   Mobile banking service in Kenya using the mobile phone

QASO -   Quality Assurance and Standards Officer

UNESCO -   United Nations Educational Scientific and Cultural Organization

UNDP -   United Nations Development Programme

WAN -   Wide Area Network

WBT   -   Web Based Training

ZAP -   Mobile banking service in Kenya using the mobile phone

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CHAPTER ONE

INTRODUCTION

This chapter serves as an introduction to the study and it aims at contextualising the research study, presenting the bbackground to the sstudy, the problem statement, purpose, objectives, significance, scope and limitations, assumptions and the theoretical framework of the study.

1.1   Background to the Study

Educational systems around the world are under increasing pressure to use new information and communication technologies (ICTs) to teach students the knowledge and skills they need in the 21st century. The challenge confronting our educational systems is how to transform the curriculum and teaching-learning process to provide students with the skills to function effectively in this dynamic, information-rich, and continuously changing environment (Omwenga 2004:). In practical terms, this curriculum transformation can be fast-tracked by incorporating modern distance learning instructional practices which utilize computer-based technologies and the Internet. *Ibid* (2004) also states that ICTs provide a window of opportunity for educational institutions to harness the use technology to complement and support the teaching- learning process. E-learning is an example of the use of these ICT supported teaching and learning methods whose use in education institutions is gaining momentum with the passage of time. In this regard the emerging and evolving changes taking place in education concerning the emergence of ICTs is an area that needs intense scrutiny by educational researchers and practitioners.

Oblinger (2005), writing specifically of the US context, has identified four broad reasons why educational institutions might embrace ICT-based distance learning: First is expanding access. Distance education can assist in meeting the demand for education and training, demand from the general populace and businesses, especially because it offers the possibility of a flexibility to accommodate the many time-constraints imposed by personal responsibilities and commitments. Secondly, ICT-based distance learning can also alleviate capacity constraints by being mostly or entirely conducted off-site the system, thereby reducing the demand on institutional infrastructure such as buildings and physical sites for operation. Since modern populations value of lifelong learning, that is schooling beyond the regular normal age, institutions can benefit financially from this educational venture by adopting distance education and boosting their financial bases. Above all, ICT-based distance education can also serve as a catalyst for institutional transformation in the competitive modern business. Recent telecommunications developments, particularly integrated voice, video and data systems, as well as satellite and compression technologies, have made distance education a viable alternative to improving access to educational opportunities for learners of all ages, at all levels and in diverse environments.

Since the 1980's, integration of ICTs in education has been compulsory in developed nations (UNESCO 2005). This has not been so in developing countries such as Kenya, where ICT integration in education has been considerably more recent, small scale and experimental in nature. It is, however, generally recognised that the interest for adoption of ICT in education has progressed considerably in the recent past in most African countries, including Kenya. Oyomno (2005) observes that in the past five to ten years, a growing number of governments have formulated or initiated the process of formulating national ICT policies for their countries.

These policy documents, he observes, are largely a response to the African digital divide. Through these policy instruments, African governments seek to improve their national competitiveness in a rapidly growing ICT- enabled global economy and to check and reverse the threats of the digital divide. There is a growing awareness of the impact of Africa's 'digital' poverty on its capacity to beneficially exploit its digital opportunities and resources for social and economic development.

Kenya on its part has made a number of attempts to develop a national ICT policy. In the education sector, ICT policy in Kenya is embedded in the *E-government Strategy (2006)* and draft *National ICT Policy* (2006) documents. These documents formed the basis for the policy guidelines in the Sessions Paper No. 1 of 2005 which is the policy document that guides ICT integration in education in Kenya. This policy document is operationalised through the *National ICT Strategy for Education and Training* (2006) which contains the strategies for integration of ICT in the education sector.

This study is examining the factors influencing ICT integration in training institutions; the focus is Kenya Education Staff Institute (KESI). KESI is the capacity building unit of the Ministry of Education in Kenya. This Institute was established by the Government of Kenya in 1981 through funding under the World Bank IDA Fifth Education Credit. The Institute was formally constituted through *Legal Notice No. 565 of December 1988*, gazetted by the Minister for Education. KESI is mandated to develop the managerial capacity of all personnel and stakeholders in charge of education administration and management by disseminating knowledge, skills and attitudes to the target groups through training. KESI's target groups include head teachers of primary schools; principals, deputy principals and heads of department

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of secondary schools, teacher training colleges and technical colleges: members of Board of Governors, School Management Committees; and field education officers. Currently, the target groups for KESI education management training stand at 455,000 (Revised KESI Strategic Plan. 2009). KESI trains its clients through instructor-led F2F interaction in national, provincial and district workshops.

1.2: Statement of the Problem

In the present information age, knowledge development is increasingly becoming a technologically aided process. While the value of technology lies in its ability to train anyone, anytime, anywhere, implementing and sustaining such technology-aided programmes require more than merely moving education and learning online. If we are to develop, deliver and administer e-learning programmes, and train educators to become competent e-learning facilitators, a high level of investment in ICT infrastructure is required. Successful e-learning implementation, therefore, depends on building a strategy that meets the needs of the learners as well as the business goals of the institution. Garrison & Anderson (2003).

Kenya Education Staff Institute, whose mandate is to build and upgrade the professional capacity of education managers and stakeholders in Kenya through in-service training, relies on face-to-face workshop/seminar training methods with a lean staff of resident-trainers and regional Trainer of Trainers. This F2F training approach, which targets over 500,000 learners, is slow, ineffective and not cost-effective (KESI Training Reports 2007). Is there a faster, effective and cost effective alternative method of training delivery that can be adopted by KESI? There is, therefore, a gap in information about alternative curriculum delivery strategies. This study seeks

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to fill the existing information gap by exploring the effectiveness of ICT integration as a tool to improve the quality of capacity building and curriculum delivery at KESI.

1.3 Objectives of the Study

The objectives of this study are to:

1. Identify the main training approaches used in capacity building at KESI

2. Determine what level of ICT integration in capacity building has been attained at KESI

3. Find out the cutting edge ICT tools available for pedagogical activities in training institutions

4. Explore ways through which ICT can be integrated as a tool to enhance the quality of capacity building mandate for KESI.

1.4   Research Questions

1. What are the main training approaches used in capacity building at KESI?

1. What level of ICT integration in capacity building has been attained at KESI?

2. What are the cutting edge ICT tools available for pedagogical activities in training institutions?

3. How can ICT be integrated as a tool to enhance capacity building at KESI?

1.5 Significance of the Study

This study is examining KESI's e-Readiness capacity in the context of planning to incorporate e-learning curriculum delivery strategies. Since this assessment involves a descriptive study the study will act as a catalyst for e-Learning implementation through selective methods of instructional media-mix. It is envisaged that this document will form a basis for dialogue with stakeholders in soliciting for funding of e-Learning programmes at KESI and similar training institutes. The study will also add to the existing body of knowledge of literature in e-Learning. The study may also suggest new hypothesis that may require to be tested in larger subjects. The findings may also trigger administrators of similar institutions to organize in-service courses for the members of their training departments to implement effective learning at a distance.

1.6 Scope of Study

This study was conducted in the Rift Valley Province of Kenya where field Education Officers and a sample of principals, from secondary schools were also interviewed.

1.7 Limitations of the Study

Since the study mainly focuses on e-learning, the environment of the study may reveal a lot of information on distance learning which may not be useful to our study. Besides, the anticipated respondents are field workers who may be not necessarily be at their work stations during the stipulated time for questionnaire administration and interview schedules, and may only hand in the completed instruments at their own convenient time. There are probabilities that some respondents may not give factual data – this can be a limitation since it will affect the variables of this study and the researcher does not have any control over this.

1.8 Delimitation of the Study

This study is delimited to analysis of education management training programmes at KESI. Although issues raised in the study may be of general interest to the Education Sector as a whole, the subsectors that are directly or indirectly concerned with capacity building in the Ministry, like In-service Training (INSET) or Directorate of Quality Assurance and Standards will not be considered here. This is because the main targets of respondents are cohorts of trainees who have interacted with KESI face-to-face training.

1.9 Assumptions of the Study

I hoped to complete this study and get the intended results amidst a number of assumptions as follows:

1. It should be noted that this work was conducted among field education officers in the Rift Valley province. Field administration has its own administrative procedures, rules and regulations. It was my assumption that these administrative issues would not be a bottleneck that could make carrying out this research difficult. My aim was to ensure that I have proper authorization and introduction letter.

2. The study was conducted through interaction with materials and administrators who were expected to actively participate in responding to pre- designed questionnaires. It was my assumption that the respondents would give sincere answers to the questions posed and that they would do this timely.

3. My last assumption was that there are field officers who have undertaken KESI professional capacity building courses in education management. Using the KESI training database, I hoped to locate the ex-trainees in the field.

1.10 Definition of Significant Terms

Demand

Demand is the felt need of educational planners, administrators and potential consumers in identifying the actual goods and services they require in pursuing their educational goals.

Information Communications Technologies

A diverse set of information, communication and technological tools and resources used to transmit, store, create, share or exchange information. These tools and resources include computers, the Internet (websites, blogs and emails), live broadcasting technologies (radio, television and web casting), recorded broadcasting technologies (podcasting, audio and video players, and storage devices), camera and telephony (fixed or mobile, satellite, Visio/video-conferencing, etc.).

ICT Policies

ICT Policies are plans and strategies put in place by education authorities or the faculty in the acquisition, use and dissemination of knowledge by using a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. These technologies include computers, the Internet, broadcasting technologies (radio and television), and (mobile) telephony.

ICT Infrastructure

ICT Infrastructure refers to hardware, software and network connectivity used to support learning about ICT, learning with ICT and learning through ICT.

Integration of ICT is the ability to manipulate Information Communications Technologies to pursue value and create opportunities facilitated by the use of the Internet. The use of ICTs to supplement traditional pedagogical and school management practices is what is commonly referred to as ICT integration in Education.

Staff Capacity Building

A deliberate effort to teach or provide training to an individual member of staff, trainee, person or persons in a training institution (in this case KESI staff trainer/trainee) in order to improve their (level of) ICT knowledge, skills and experience.

1.12 Organization of the Study

This study is organized into a number of chapters, logically following each other, starting with chapter one (Introduction), chapter two (Literature review) chapter three (Research methodology), chapter four (data analysis, presentation and interpretation), chapter five (summary of findings, discussion, conclusions and recommendations) and, finally references and appendices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The first part of this chapter examines the following elements of Integration of ICT in Education:

definition of the concept of Integration of ICT in Education, the significance, approaches and

stages of ICT integration. The second part explores the three pillars of good distance learning

practices, namely, ICT policies, ICT infrastructure and capacity building of staff for the

establishment of an ideal distance learning system in a training institution. These three pillars

are the independent variables of this study. The chapter winds up with a conceptual framework

and chapter summary.

2.2 Integration of ICT in Education

2.2.1 Definition

Information and Communication Technologies (ICTs) are commonly defined as a diverse set of

technological tools and resources used to communicate, and to create, disseminate, store, and

manage information. These technologies include computers, the Internet, broadcasting

technologies (radio and television), and telephony (Blurton 2002). ICTs can further be grouped

into three functional categories: The first category is Information Technologies that use

computers; secondly, are telecommunications technologies which include telephones (with fax)

and the broadcasting of radio and television, often through satellites; and thirdly, networking

technologies, of which the best known is the Internet, but which has extended to mobile phone

technology, Voice Over IP (VOIP) telephony, satellite communications, and other forms of

communication.

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Globally, educational systems are under great pressure to adopt innovative methodologies and to integrate new Information and Communication Technologies (ICTs) in the teaching and learning process, to prepare students with the knowledge and skills they need in the 21st century (Kainth & Kaur (2006). This pressure has greatly transformed the practice of distance learning by giving it a wide array of tools with which to communicate transcontinental learning. This is what is commonly known as ICT integration. In education practice, technology is integrated when it is used in a continuous manner to support and extend curriculum objectives and to engage students in meaningful learning. It is not something one does separately; it is part of the daily activities taking place in the classroom. The term "ICT integration" connotates a range of learning environments from a stand-alone computer in a classroom to a situation where the teaching is done by the computer through pre-packaged "teacher-proof courseware" (Laferrière, 1999). The term "integration" reflects a change in pedagogical approach to make ICT less peripheral to schooling and more central to student learning. The use of ICT can support the new instructional approaches that go hand in hand with the shift towards learner-centered learning and make hard-to-implement instructional methods such as simulation or cooperative learning more feasible. ICT can also play a role in helping a teacher explain abstract concepts like currents, DNA and cell division.

2.2.2 Significance of ICT

Educators commonly agree that ICT has the potential to improve student learning outcomes and effectiveness if it is used properly (Wang 2001). The technology has great potential to increase

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learners' motivation, link learners to various information sources, support collaborative learning. and allow teachers more time for facilitation in classrooms.

Generally, there are some critical benefits of ICT, when used in the right way: ICT can play a role in accelerating the paradigm shift as it can be used to actively engage students, make them collaborate and reflect on their learning and through simulations (of abstract concepts) it can help contextualize content. At the same time. globalization and the shift to a 'knowledge-based economy' require that educational institutions develop in individuals the ability to transform information into knowledge and to apply that knowledge in dynamic, cross-cultural contexts. Apart from accelerating the paradigm shift, the Education for All (EFA) objectives under the MDGs have put pressure on countries and governments (including Kenya) to provide education to all members of the population — even in the face of scarce financial, physical, and human resources — as a precondition for economic and social development. ICTs are a means for meeting these challenges. In this context, therefore, the theories of learning that hold the greatest way today are those based on constructivist principles. The strength of constructivism lies in its emphasis on learning as a process of personal understanding and the development of meaning in ways which are active and interpretative. In this domain, learning is viewed as the construction of meaning rather than as memorization of facts (Jonassen & Reeves, 1996).

2.2.3 Demand for ICT integration

Demand for Integration of ICT in Education in modern nations is guided and promoted by some key factors which include international educational targets and milestones like Education for All (EFA), UPEs, and MDGs, a country's technological and industrial advancement which gives its

workforce, especially teachers, an added advantage. UNESCO (2006) planning guide for ICT integration in teacher-education, for example, cites three key principles for effective ICT development in Teacher Education: that technology should be infused into the entire teacher education programme, implying that ICT should not be restricted to a single course but needs to permeate in all courses in the programmes; secondly, that technology should be introduced in context, for example, ICT applications like word-processing, databases, spread-sheet and telecommunications should not be taught as separate topics rather be encountered as the need arises in all courses of Teacher-Education programmes; and that students should experience innovative technology supported learning environment in Teacher-Education programmes. This requires that students should see their lecturers engaging in technology to present their subjects utilizing power point or simulations in lectures and demonstrations. Students should also have the opportunity to use such applications in practical classes, seminars and assignments.

Kainth & Kaur (2006), writing specifically about ICT integration experience in India, observe that, India's strong technological and industrial advancement make the ICT integration realistically workable. They further indicate that, globally, there are four established primary approaches to ICT integration in education. These are   ICT skills development approach, subject- specified approach, ICT pedagogy approach, and practice-driven approach.   In ICT skills development approach, importance is given to providing training in use of ICT in the trainees' day-to-day activities; in subject- specified approach, ICT is embedded into one's own subject area to expose students to new and innovative ways of learning and provide them with a practical understanding of what learning and teaching with ICT looks and feels like.   In ICT pedagogy approach, there is emphasis on integrating ICT skills in respective subjects (using

Constructivism) to foster the attainment of learning outcomes. Finally, in practice-driven approach, the emphasis is on providing exposure to use of ICT in practical aspects of teacher-training, paying attention to developing lessons, assignments etc. using ICT and implementing these in their practical work experience at various levels.

In Malaysia, ICT has a central role in maintaining the quality of higher education and it is a basis for competitive advantage of the universities. The IT agenda was initially driven by technological and scientific forces and innovations as well as the supply and demand and marketing forces and entrepreneurship (Bajunid, 2002). Consequently, formal and informal education programmes are being offered using e-Learning mode because it is readily available and adequately mainstreamed through the Malayan Smart School Programme.

The situation is quite different in emerging African economies where there are challenges like shortage of qualified staff, large student populations, budgetary constraints, inadequate infrastructure and brain drain in the teaching fraternity (Janssens-Bevernage et al 2006). Jensen (2002) gives several reasons for limited access to ICT infrastructure in developing countries. He notes that the general low level of economic activity means that technology is often unaffordable. Many African countries still have irregular or non-existent electricity supplies, which makes ICT use problematic. Furthermore, he notes that rail, road and air transport is limited and this infrastructure is needed to implement and support ICT infrastructure. Many tax regimes define computers and cellular phones as luxury items. This adds to the prices of these goods, the vast majority of which must be imported, and so makes the technology even more

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unaffordable for most schools. Furthermore lack of skills also makes widespread of ICT integration difficult.

In Kenya the transition from traditional learning (teacher centered learning) to learner centered learning has commenced. Teacher training institutions (Preset and INSET) are incorporating learner centeredness in their practice. However, the effect in the Kenyan classrooms is yet to be felt. Capacity building and exposure to other examples will enhance the shift in role of the teacher from 'sage on the stage' to a 'guide at the side'. This requires an attitude change among teachers, students and (education) managers.

2.3   Stages of ICT Integration

UNESCO Bangkok (2005) has been very active in the field of ICT integration and has, based on various studies undertaken in developing and developed countries, identified four broad stages of ICT adoption and use in educational systems. The stages are as follows: emerging, applying, infusion and transformation. The emerging stage is linked to discovering ICT tools, and acquiring basic ICT literacy skills. It is about awareness that ICTs can be used in classrooms. The applying stage involves learning how to use ICT tools and apply the knowledge in the various subjects. At the third phase, infusion, people understand how and when to use ICT tools to achieve a certain purpose. This implies that users are able to make a decision in which situation ICT might be helpful and they are able to use it for the needed purpose. Finally, the fourth stage, transformation, is when a learning situation is transformed through the use of ICT. Figure 1 below summarizes these stages.

Fig 1: Stages of ICT Integration

Specializing in the use of ICT	**Transforming**	Embedding LMS and WBI
Understanding how and when to use ICT	**Infusing**	Infusing multimedia and simulation
Learning how to use ICT	**Applying**	Integrating CAI/CBT/CAL
Becoming aware of ICT	**Emerging**	Using presentation software
(a) Based on usages		**(b) Based on delivery medium**
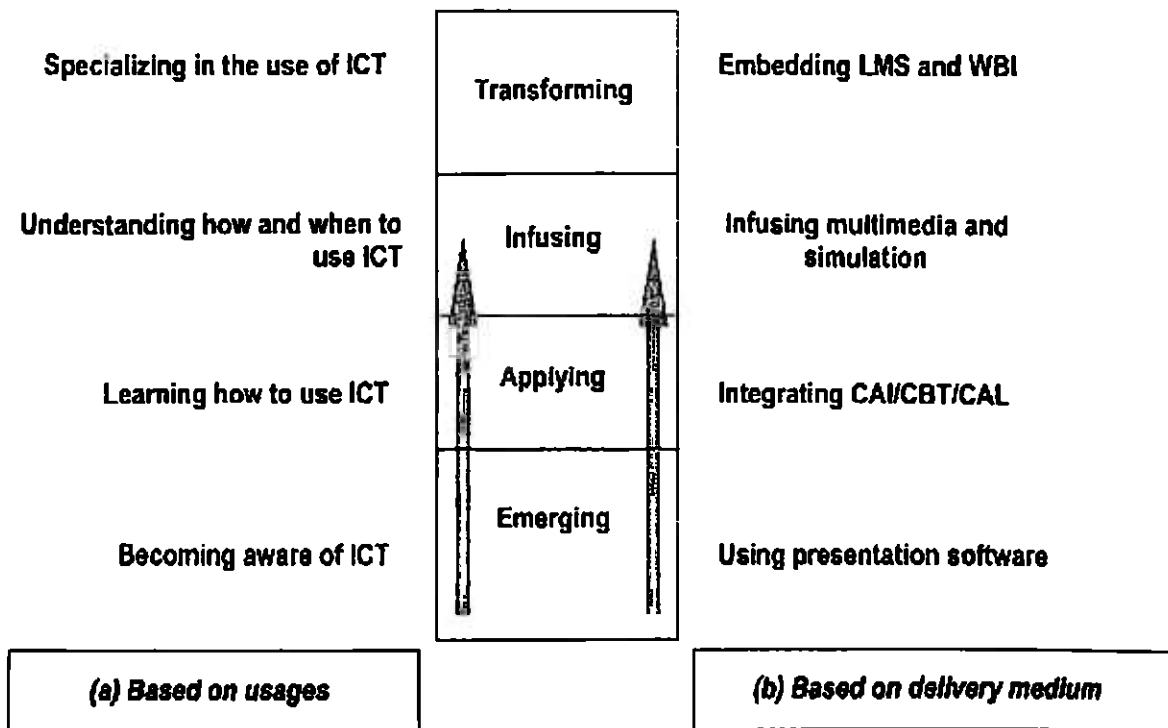
Source: UNESCO Bangkok (2005)

Analyzing the situation of ICT Integration in Kenya using the four stages as defined by UNESCO, we can generally say that Kenya is at the emerging level. Although, some people in and around in urban areas and the field officers might have reached other levels, the country as a whole is at the level of "increasing awareness" of the existence and added value of ICT. The fact that some schools with computers (or computer labs) use them mainly for computer studies is supporting this. Furthermore, it is reality that some schools with computers are not using them because head teachers and/or principals do not know what to do with them. Those computers remain idle in their boxes or gather dust locked up in a room.

2.4 Independent Variables

2.4.1 ICT Policies

Policies are strategies. A strategic plan for distance learning begins with a coherent policy. A national distance learning policy may be seen as a roadmap that establishes the vision of a government and its people. Ramdoo (2009) observes that national distance learning policy draws on national resources, contributes to a better understanding of concepts that are related to national concerns, organizes more effective and efficient practice, and plans for positive changes for example, improving rather than increasing access, decreasing costs, attracting investors, and enhancing public confidence at local and international levels of significant value is identifying the key development areas of concern. These development areas include program development, staff training, advocacy for stakeholders (including policy makers), market research, decisions about the appropriateness of available distance education, provision for accompanying ICT legal frameworks, and funding lobbied for and provided in national budgets, among others

In order for it to work, Distance Education policies must be realistic. An institution's Distance Education policies must take into account the reality that Distance Education is different from on-campus education in the way it is taught, how the material is delivered to learners, and how the students actually learn and interact with their teachers/facilitators and each other. An institution's policy makers must also consider how Distance Education policy is influenced and partly shaped by state and national policies, new technologies, accreditation requirements, institutional legislation and existing internal policies and procedures (The Commonwealth of Learning 2009).

Developing distance education policy and implementing it takes a great deal of effort. At the national level, policies will mostly deal with national funding. monitoring and evaluating distance education programs. Moore and Kearsley (1996) observe that the administration of distance education programs involves planning, staffing, budgeting, scheduling, and quality assessment. Each of these areas affects policies proposed at institutional and national levels.

One critical policy issue at the national level is the development of a seamless educational system in which students can learn through multiple organizational frameworks (Spears & Tatroe, 1997). This means providing educational opportunities at home, in schools, or in the workplace through a system that integrates training, credit offerings, and mandatory education.

Juma (2005), reporting on Open Distance Learning programmes in Eastern Africa, observes that it is clear that there is a lack of coherent policy for distance education at the national level. Consequently, distance education programmes in higher education are generally disjointed and run on ad hoc basis. She recommends that the (Eastern African) governments, therefore, need to develop and articulate national policies for the development of distance education. The Commission for Higher Education (CHE) should establish a section that should specifically deal with distance education programmes in both public and private universities. Commission for Higher Education (CHE) should put in place national and institutional policies and guidelines for the establishment of Distance Education programmes. There is need to commission relevant policy research to provide baseline information on existing Distance Education programmes conducted by public and private universities. There is an urgent need to carry out a nationwide survey to establish the demand for distance learning and modalities for establishing future DE programmes.

The recent government initiatives to integrate ICT into Kenya Secondary schools are highlighted in the *Sessional Paper No. 1 of 2005*, the current policy framework for the Ministry of Education. The document recognizes the role of ICT in promoting economic development. It emphasizes that the government appreciates and recognizes that, an ICT literate workforce is the foundation on which Kenya can acquire the status of a knowledge economy. The Sessional Paper, points out that the Ministry of Education's policy on ICT is to integrate ICT education and training into education and training systems in order to prepare the learners and staff of today for the Kenya economy of tomorrow and therefore enhance the nation's ICT skills. The document enumerates the government's strategies for enhancing ICT in schools as follows: to develop a national ICT education policy and strategy, to work with stakeholders to ensure the implementation of the NEPAD e-school initiative, to promote expanded use of ICT as a tool for effective management, research and development at all education levels. Other strategies include developing a policy on the provision of adequate infrastructure at all levels of education and training by bringing out together the efforts of all stakeholders, to promote public and private sector investment in ICT with the education and training sector, and to provide computers to primary, secondary schools and teacher training colleges.

The policy initiatives stipulated in the *Sessional Paper No. 1 of 2005* led to the development of the *National ICT Strategy for Educations and Training* in June 2006. This strategy document was prepared by the Ministry of Education in collaboration with stakeholders form the public, private, civil society and development partner sectors. It outlines how ICTs will be adopted and utilized to improve the access, quality and equity in the delivery of education services in Kenya.

All the above policies and strategies are linked to *Kenya Vision 2030* which is the country's blue-print for social, political and economic development.

At Institutional level, Open Distance Learning policies have some challenges. Lewis (1998) identifies three significant problems at the institutional level for developing policies for distance education. The obstacles are as follows: first is the long-established academic culture that holds a firm view of teaching as an individual's act in a classroom. Secondly, the power to change the system is held by senior faculty and administrators, most of who are satisfied with the system (status quo) that gave them power. Thirdly, a rich array of technological and human resources is dissipated in a system of faculties, divisions, and departments, each of which guards its own interest. What happens at the institutional level is significant if a change in policy is to occur on a broader scale. It is, therefore, crucial for institutional policy makers to develop a thorough understanding of faculty experiences in the distance learning environment before implementing new procedures (Parisot 1997). The first solution to these problems is forming an understanding of ideas for developing distance education at the institutional level. Furthermore, it would help to acquire a demonstration project so that people can see how the distance education process works.

Consequently, the Kenya Education Staff Institute (KESI) capacity building policies and envisaged ICT policies follow the above mentioned guidelines as enabling factors for e-readiness. These policies focus on the computerization process, such as planning, implementation, effectiveness and evaluation. The guidelines provide an outline of the steps to take and pitfalls to avoid when selecting new computer systems or upgrading existing ones. They

are expected to help private organizations in computerizing their operations, solve the problems that many of them face and ensure that they obtain maximum returns on their investments."

2.4.2 ICT Infrastructure

A country's educational technology infrastructure sits on top of the national telecommunications and information infrastructure. Before any ICT-based programme is launched, policymakers and planners must carefully consider the following: appropriate space/ rooms or buildings available to house the technology, availability of electricity and telephony, and ubiquity of different types of ICT in the country in general, and in the educational system (at all levels) in particular (Wikibooks, 2009).

Information Communication Technologies are used worldwide to increase access to, and improve the relevance and quality of education. ICT Integration presupposes the use of various ICT resources at the different levels to improve quality, efficiency and effectiveness of curriculum delivery. ICT infrastructure comes in two distinct forms, namely, the hardware and software components. Hardware comprises local area network, wide area network and associated communication devices such as collaboration tools (e.g. video conference equipment) and Internet connectivity. Software mainly refers to digital content requisite for the training activities and e-learning resources and tools such as educational portals and sites. As with any pedagogical change, successful implementation of technology is dependent upon faculty acceptance and participation (Vivian 1998).

There are several reasons for using technology in distance education and training. They include improving access to education and training, improving the quality of learning, reducing the costs

of education, and improving the cost-effectiveness of education. Research has shown that the appropriate use of ICTs can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century. If designed and implemented properly, ICT-supported education can promote the acquisition of the knowledge and skills that will empower students for lifelong learning. When used appropriately, ICTs—especially computers and Internet technologies— enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way (Tinio 2006).

UNESCO (2006) observes that ICTs can be used in education to achieve the following objectives: improve administrative efficiency, disseminate teaching and learning materials to teachers and students, improve the ICT skills of teachers and students, allow teachers and students access to sources of information from around the world, share ideas on education and learning, collaborate on joint projects and conduct lessons from a remote location.

GeSCI (2009) actually identifies three major concepts embedded in learning with ICT. They include problem solving, innovation and collaboration. Technology can be used to deliver training right into the workplace by embedding training in computer applications, by enabling just- in- time or on-demand training, and by bringing specialists from anywhere in the world into conferences and meetings. This certainly widens access to employers and employees. With the advent of ICT, geographical distance is no longer an obstacle to obtaining an education. ICT gives students and teachers new tools with which to learn and teach. It is no longer necessary for teachers and students to be in the same space, due to innovations of technologies such as teleconferencing and distance learning, which allow for synchronous learning.

ICT Infrastructure can also improve quality of education. Gutterman et al (2009) for example, observe that ICT can enable teachers to transform their practices by providing them with improved (computer generated) educational content and more effective teaching methods. Through online teaching resources and other interactive educational materials, teacher development can be greatly improved. Furthermore, ICT can improve the learning process through the provision of more interactive educational materials that increase learner motivation and facilitate the acquisition of basic skills. The use of various multimedia devices such as television, videos and computer software can offer a more challenging and engaging learning environment for students of all ages. Twenty-first century education reform policy has been focused on a shift from the traditional teacher-centered pedagogy to more learner-centered methods. Active, collaborative learning environments facilitated by ICT contribute to the creation of a knowledge-based student population.

However, ICTs are not a panacea or cure-all for gaps in education provision. Ng et al (2010), citing examples in Malaysia and the Philippines, observe that the right conditions need to be in place before the educational benefits of ICT can be fully harnessed, and a systematic approach is required when integrating ICTs into the education system. This fact is often overlooked and, in their eagerness to jump on to the technology bandwagon, many education systems end up with technologies that are either not suitable for their needs or cannot be used optimally due to the lack of trained personnel. In Malaysia, for example, it has been pointed out that '[o]ver-dependence on vendors and lack of monitoring are causing the (Malaysian) Government millions of dollars for the rollout of various ICT initiatives. In the Philippines, the fixation with

technology is demonstrated by the fact that the bulk of funding for ICT in schools projects goes to hardware and very little goes to teacher training.

2.4.3 Capacity Building of Staff

In contemplating developing staff capacity for ICT integration, there is a tendency to focus on teachers because they are the key element in curriculum adoption, implementation and innovation. However. since institutions store large quantities and varieties of ICT equipment, it becomes necessary to engage and build the capacity of dedicated technology coordinators, and technical support staff.

Pelgrum et al (1993) observe that inclusion of ICT integration in educational institutions entail introduction of new educational technologies, and aims at bringing about a broad curriculum reform requiring teachers to acquire new technical skills associated with their changing roles and practices in the learning process. Consequently, staff development should include initial teacher education and regular updating of ICT knowledge and skills and continuing professional development on changing curriculum and pedagogical practices in the integration of technology into the educational process. Some key training areas include informatics teachers, subject teachers for various subjects taught in school/college, technology coordinators and course administrators. All these cadres of professionals also require training in core ICT integration competencies like handling hardware and software, curriculum design, coaching, monitoring, developing digital materials, developing strategic frameworks for ICT integration in education, and collaboration and networking.

Juma (2005), in her analysis of Distance Education programmes in East African countries, showed that in many of the countries, only a few institutions had adopted Distance Education modes of delivery. This scenario is largely because there is a serious lack of professional staff development for distance learning. She, therefore, recommends the following interventional measures: First, for the distance education practice to sell well, a critical mass of players (the policy makers and institutional managers) must be sensitized in distance education practices to supplement the global clamour for modern "alternative" curriculum delivery methods. Further to this, institutions should have in-house staff development for distance learning programmes like research and evaluation, development of curricula specialists, development of interactive learning methods and materials, identifying cost-effective media and technologies for use in distance learning programmes, applying the most appropriate media and technologies to support learning outcomes; others are localizing course deliveries that are based outside the African continent, particularly the African Virtual University (AVU), and establishing teaching/learning support services in the respective countries.

Other players to be targeted are educational administrators, technical support specialists and content developers. In addition, ICT skills that come along with this shift in pedagogy are also useful for students hoping to transition into today's job market, which in many countries is increasingly demanding these skills. Developing a critical mass of knowledge workers with proficient ICT skills will greatly improve long term economic opportunities. Education leadership, management and governance can also be improved through ICT by enhancing educational content development and supporting administrative processes in schools and other educational establishments, Gutterman et al (2009).

2.3 The Conceptual Framework

The conceptual framework used in this research is an interaction between three types of variables; the independent variables. the intervening variables and the dependent variables as shown in the figure 2 below:

INDEPENDENT VARIABLES

INTERVENING VARIABLES

DEPENDENT VARIABLE

ICT Policies

Demand
(i)   ICT Infrastructure
(ii)   Capacity Building

Flexibility to Change

Funding
Corporate/Personal
Support

Integration of
ICT in training
programs
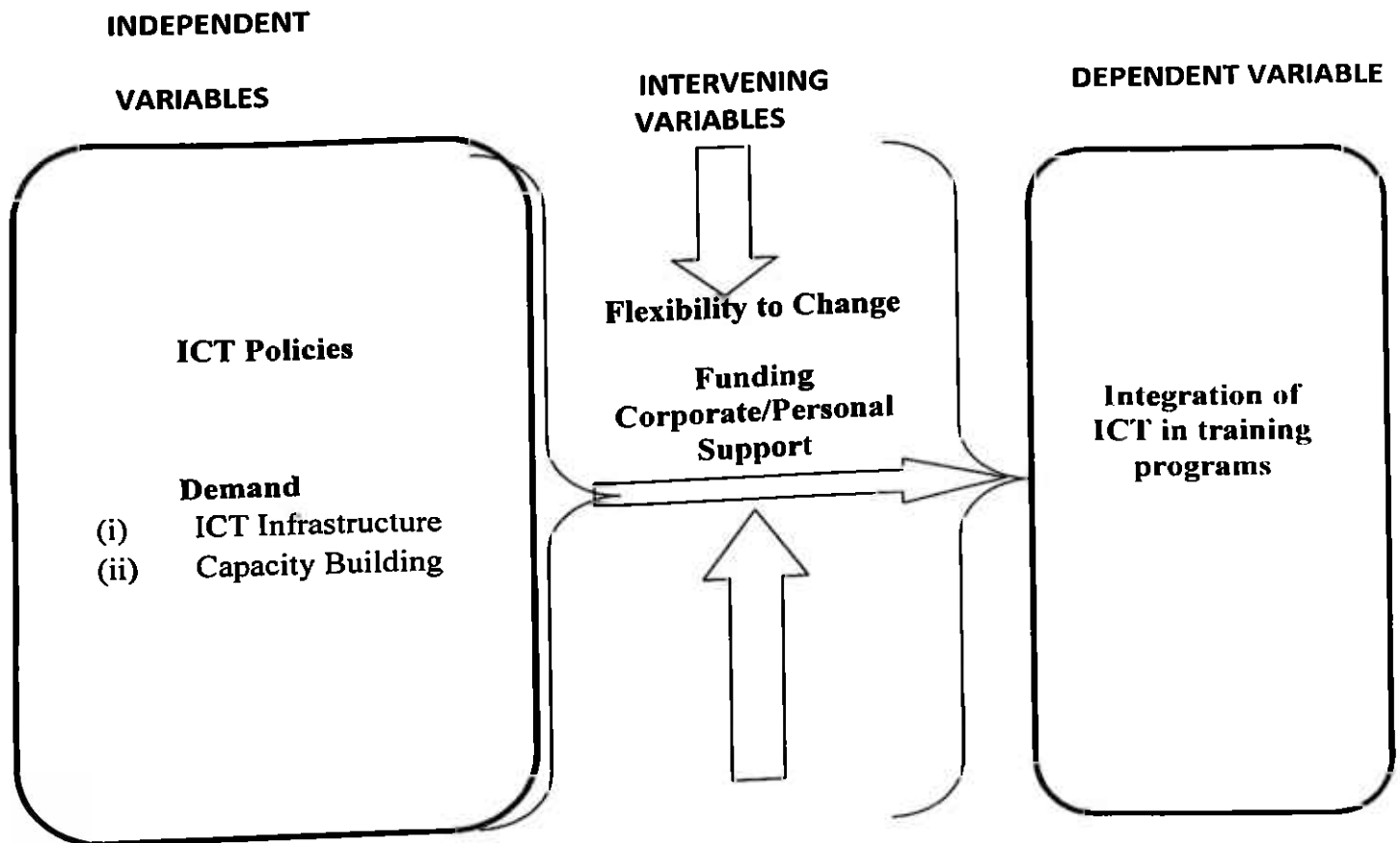
These three sets of variables are perceived to have complementary relationships. The independent variables focus on three pillars of distance learning, namely. ICT policies. infrastructure and staff capacity. The intervening variables, flexibility to change, funding and corporate and individual support efforts in adopting ICT based professional and technical skills and services, are conceived to work in concert to propel ICT competence and performance in the integration process.

2.5 Summary and Conclusion

This chapter has presented a review of literature in the area of Integration of ICT in Education. Despite the scarcity of literature on this area particularly on ICT in Kenyan schools, valuable information was retrieved from internet sources and from government documents and reports. The chapter has highlighted key elements in the Integration of ICT in Education by defining the concept of integration, its significance, approaches and stages. The chapter has also explored the three pillars of good distance learning practices, namely, ICT policies, ICT infrastructure and capacity building of staff for the establishment of an ideal distance learning system in a training institution. The chapter wound up with a conceptual framework and chapter summary.

The overall message is that ICTs can improve access to and promote equity in education by providing educational opportunities to a greater number of people of all ages, including the traditionally unserved or underserved. Secondly, ICTs can enhance the quality of teaching and learning by providing access to a great variety of educational resources and by enabling participatory pedagogies. Third, ICTs can improve the management of education through more efficient administrative processes, including human resource management, monitoring and evaluation, and resource sharing.

For ICT to be effectively deployed as a tool in capacity building at KESI there is need for a certain minimum ICT infrastructure to be put in place. As a training institution, KESI focuses on teaching and learning activities as well as research and development. Each of these activities entails sharing of training personnel and content, collaborations with other institutions and research inter alia. The subsequent chapters of this research will attempt to demonstrate how these activities can be coordinated for maximal ICT utilization.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section deals with description of the methods applied in conducting the research study. It is divided into the following subsections: research design, study location, target population, sampling procedure, research instruments, reliability and validity of the instruments, data collection procedures and data analysis techniques.

3.2 Research Design

This study is examining the factors influencing ICT integration in training institutions: a case of Kenya Education Staff Institute (KESI). Descriptive, survey design was found to be most suitable. A descriptive survey describes and interprets what it is. It is concerned with conditions or relationship that exist, opinions that are held, processes that are going on, effects that are evident or trends that are developing. It is primarily concerned with the present, although it often considers past events and influences as they relate to current conditions (Best and Kahn 2003).

Further, Mugenda and Mugenda (2003) say that survey research seeks to describe existing phenomena by asking individuals about their perceptions, attitudes, behaviour or values. Survey therefore is a type of descriptive research. Apart from describing, surveys can be used in explaining or exploring the existing status of two or more variables at a given point in time.

Kraemer (1991) cited in Glasow (2005), identifies three distinguishing characteristics of survey research. First, survey research is used to quantitatively describe specific aspects of a given population. Second, the data required for survey research are collected from people and are,

therefore, subjective. Finally, survey research uses a selected portion of the population from which the findings can later be generalized back to the population.

Cross-sectional surveys are data collected at one point in time from a sample selected to represent a larger population (Owens 2002:3). In cross-sectional survey, information is collected at a single point in time with the purpose of describing the characteristics of a general sample of a population, identifying differences among particular subgroups, or assessing interrelationships among variables within the sample as of the time of the study. Cross-sectional designs take a snapshot of a moment in time where people at various levels that are attainable only through the passage of time can be compared (Touliatos & Compton 1992:267).

The descriptive survey design was also found to be appropriate because according to Orodho (2005: 15), it does not deal with a single case but rather several cases sampled from the target population. Orodho also contends that this kind of study is concerned with gathering facts and /or figures rather than the manipulation of variables. In this respect, from the representative sampled population, the researcher used the frequency or number of answers to the same question, hence the survey design. The design involved collecting data on a sample or cross-section of the respondents who were selected to represent education managers at KESI headquarters, field education managers and Institutional managers.

3.3   Variables

The dependent variable in this study will be the level of ICT integration into training programmes . The independent variables, on the other hand, include ICT policies, infrastructure and staff capacity. The intervening variables, flexibility to change, funding and corporate and

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individual support efforts in adopting ICT based professional and technical skills and services, are conceived to work in concert to propel ICT competence and performance in the integration process.

3.4 Target Population

The survey essentially involved the KESI staff trainers themselves as the principal respondents and four other cadres of target trainees in the field. The field target subgroups, which were distributed in the Rift Valley Province, are in charge of education policy implementation, curriculum implementation and decision making in field education offices (DEOs/PDEs' offices) and schools on a daily basis. They were as follows: Senior Education Officers, Education Officers, Quality Assurance and Standards Officers, and Principals of secondary schools. Sampling was limited to Rift Valley Province because of the heterogeneity of the region; that is, the province covers a wide variety of geographical conditions that are representative of Kenya – arid, semi-arid and very fertile regions. It covers remote areas of West and East Pokot through North Baringo, Koibatek, Trans Nzoia, Uasin Gishu and Nakuru Districts. This vast region also traverses unique infrastructural and connectivity realities (urban, peri-urban, and rural) that can confidently be replicated in any pocket of the Republic of Kenya.

3.5 Sampling Techniques

The researcher applied stratified sampling technique to ensure that the sample is representative of the various strata of the target population. Stratified sampling involves identifying subgroups of the population representative of the percentages of those same subgroups in the general population being studied. This was identified as the appropriate sampling technique because the

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targeted respondents are divided into four strata: Senior Education Officers (SEOs), Education Officers (EOs), Quality Assurance and Standards Officers (QASOs), and Principals of secondary schools. The researcher targeted at least thirty per cent (30%) of the respondents who have attended the KESI face-to-face (F2F) education management courses and who are not necessarily e-ready and compliant. Since these education managers do not have a homogenous working environment, it means that the ICT challenges encountered by each cadre are bound to vary. Therefore, to get a representative picture of the various ICT challenges facing various field education managers, stratified sampling of these education officials was the most appropriate. This argument is supported by the assertion that if the population from which a sample is to be drawn does not constitute a homogenous group, then stratified sampling technique is applied to obtain a representative sample (Orodho 2005:38). In a nutshell, the 50 respondents were identified through stratified sampling from the 2010 KESI trainees from Rift Valley Province as shown below: 16 were Principals of High Schools, 8 Senior Education Officers, 15 Education Officers and 11 Quality Assurance and Standards Officers. The interviews schedules comprised 12 participants.

Table 3.1: Distribution of the Study Sample

S/No.	Target Respondents	Number trained by KESI	Number Sampled	Sample Size %
1.	Senior Education Officers	25	8	32.0%
2.	Education Officers (EOs)	45	15	33.3%
3.	Quality Assurance & Standards Officers (QASOs)	34	11	32.4 %
4.	Principals of secondary schools	48	16	33.3%
	Totals	152	50	32.9%

Source: KESI Training Reports (2010)

3.5 Research Instruments

This study used the following research instruments: a questionnaire and interview schedules. The questionnaire was used to gather information from sampled respondents. The questionnaire used both open-ended and closed-ended items. The closed-ended items were limited to pre-determined set of choices. However, six closed-ended items had provision for the respondents to give any other response other than the choices given. It was expected that this would capture any useful information that the given options might have failed to capture. The open-ended items used were structured. This format of items is used to enable respondents to give responses in their own words. The open-ended items were used because the target population comprised educated respondents who are capable of comprehending the questionnaire and give varied responses as per their different challenges and experiences at their workplace. This questionnaire had three sections: Section "A" had items intended to capture some background information on the respondents. Section "B" had elaborate items that aim at establishing the e-Readiness of the environments where the respondents were performing their substantive duties as education/institutional managers. Section "C" had elaborate items intended to capture the ICT-related challenges at the workplace and their recommendations on how KESI and MOE can assist the current and future managers to address them.

3.6 Validity and Reliability of Research Instruments
3.6.1 Validity

Cook and Campbell (1979), cited in Colosi (1997), define validity as the best available approximation to the truth or falsity of a given inference, proposition or conclusion. Validity is the strength of conclusions, inferences or propositions in a research initiative. There are three

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types of validity commonly examined in social research: conclusion validity, internal validity and external validity. This means that validity assisted the researcher to determine the degree to which the items presented in the questionnaire are accurate. Further, the researcher sought the assistance of his supervisors to assess the relevance of the content in the questionnaire. The researcher incorporated the experts' recommendations in the final questionnaire to improve its validity.

3.6.2. Reliability

Reliability is the consistency of measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. In short, it is the repeatability of measurement. A measure is considered reliable if a person's score on the same test given twice is similar. It is important to remember that reliability is not measured, it is estimated. (Orodho, 2005:41) defines reliability as the ability of the research instrument to measure what it is meant to measure consistently and dependably. Reliability of measurement concerns the degree to which a particular measuring procedure gives similar results over a number of repeated trials. Reliability of the research instruments was determined through testing and re-testing. Therefore, piloting of research instruments for this study was more focused and objective. For instance, the researcher was on the lookout for instances where respondents could detect some deficiencies such as ambiguous directions, insufficient space to write the responses and faulty phrasing of items. The instruments were pre-tested to a selected sample similar to the actual sample that was used in the actual study. The expectation was that procedures used in pre-testing the instruments would be similar to those that were used during the actual study. Piloting targeted about 1% of the entire sample size. The sample used during the piloting was not included in the main study.

3.7 Data Collection Procedures

Prior to embarking on this research, the proposal was presented to the two supervisors for approval. Permission to do the research was sought and obtained from the Ministry of Education. The researcher then piloted the instruments in 5 education offices and five schools that was not included in the actual sample population. The pilot testing gave the prospective respondents a chance to critique the instruments in terms of clarity and hence ensured that vague items were streamlined to incorporate what the researcher originally intended to capture. On visiting education offices and schools, the researcher presented a letter of introduction and authority to the officers and principals explaining the purpose of the study. In keeping with ethical practice in research, the researcher gave assurance that the information gathered would be kept confidential and used for the purpose of the study only.

The research instruments were personally delivered to the education officers and school principals by the researcher. Although the questionnaires were collected at various intervals after one week, where possible, the researcher left the respondents' venue with the completed questionnaires. During the investigation, major concerns and issues were cross- checked through interviews and discussions.

3.8 Data Analysis Procedures

The researcher sorted out the filled questionnaires, identified and classified them according to the five groups of respondents. The researcher then tallied and collated the information gathered from different respondents. The categorized data were entered into a computer sheet and prepared by the researcher with the assistance of a computer specialist. The data collected was organized and analyzed by use of descriptive statistics.

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The data was analyzed as follows: analysis of the background information on the education managers, their challenges and recommendations on interventions to these challenges; data on principals and field education officers' responses on the performance and challenges facing them in integrating ICT in Education and possible intervention measures. The methods of reporting involved calculations of the frequency tables and percentages.

3.11 Chapter Summary

In this chapter, the methodology of the study was presented. This included the research design, research variables, sampling procedure, data collection instruments validity and reliability of research instruments, piloting, data collection procedure, data management procedure, data analysis and ethical issues. These steps will help the researcher to utilize methodologies adapted to generate data which will be analysed, presented, interpreted and discussed in the next chapter.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1   Introduction

This chapter presents the data collected during the research study. Both quantitative and qualitative data were collected using the questionnaires and interviews respectively. A total of 50 respondents participated in the questionnaire data collection process. Out of the total questionnaire sample, 16 were Principals of High Schools, 15 Education Officers, 8 Senior Education Officers and 11 Quality Assurance and Standards Officers. The interview schedules comprised 12 participants. The data was presented and analyzed thematically based on the objectives of the study as reflected through the research questions.

4.2   Main training approaches used in capacity building at KESI

In its capacity building mandate, Kenya Education Staff Institute has various courses it offers to its clients. The courses are offered at an average duration of one week and target mainly Education Officers, Quality Assurance and Standards Officers in the Ministry of Education school managers such as the Principals, Heads of Departments and Deans of Teacher Training Colleges. The courses, target cadres and delivery modes are shown in table 4.1 below:

Table 4.1: Courses offered at KESI

Core Education Management Course	Target Cadre	Delivery Mode
Results Based Management (RBM)	DEO, Field MoE Staff	Face to face
Strategic Management and Planning	DEO, Field MoE Staff	Face to face
Project Management	DEO, Field MoE Staff	Face to face
Induction Course in Educ. Management	Principals, Deputies & HODs of Secondary Schools	Face to face
Induction Course in Educ. Management	Primary Headteachers	Face to face

Induction Course in Educ. Management	QASOs	Face to face
ICEM for Education Officers	Eos	Face to face
Teachers' Proficiency Test (TPC)	Primary Teachers	Face to face
Snr Mgt Course for Principals,& Deans of	Principals,& Deans	Face to face
Educ. Management Sensitization course	BoG/SMC/ DEB members	Face to face
Integration of ICT in Education Management	All cadres	Face to face
Free Secondary Education (FSE)	Secondary Principals	Face to face
Guidance & Counselling Sensitization	All cadres	Face to face

The courses in Education Management are taught through face to face methods with limited use of PowerPoint presentation. All the respondents (100%) acknowledged having attended at least a core Education Management training course at KESI. Besides attending the core Education Management Courses, 46% of the respondents also attended a one week introductory course on Integration of ICT in Education Management. The course has both theory lessons and some computer-based practical work. The topics of this integration course include: introduction to computers, using computers in school management, transferring of files from the computer to mobile handsets, electronic spreadsheets, and data management techniques, among other basic computer introductory courses. However, this ICT programme only empowers the education manager to perform tailored basic functional skills on the computer. These skills pertain to their daily management functions at the workplace.

4.3: Level of ICT integration attained in capacity building at KESI?

4.3.1: Use of ICT at the work place

The research sought to establish the ICT resources respondents have and utilize at their workplace. There are prerequisite to the use of ICT namely; basic computer skills and availability of ICT equipment including electricity. All the respondents confirmed their institutions are served with the main electricity supply. A significant proportion (98%) of the respondents also said they have basic ICT skills at the certificate level.

The table below gives a summary of the results from the respondents on the ICT resources they use at their workplace for official communication and personal use:

Table 4.2: Use of ICT at the workplace

Resource	No. of respondents	% response
Landline	35	70
Mobile phone	50	100
Fax	15	30
Desktop computer	50	100
Laptop	50	100
Internet	45	90
Institutional website	20	40

From the table, majority of the workplaces use the mobile phone and computers for communication, for both official and personal purposes. Also, a large number of the institutions have Internet connectivity which the responses from the questionnaire corroborate at 90%. However, it can be inferred that few of the respondents (only 40%) use the institutional website

for communication. This can be attributed to factors such as: unreliable website functionalities. lack of relevant content and negative attitude about the usefulness of the institutional website. These factors were identified by participants during interviews.

It can, therefore, be inferred that most institutions have embraced and integrated ICT as a tool for communication. In fact, older technologies such as fax machines are being phased out as indicated by the response rate of only 30 % on the use of fax machines.

4.3.2: Competency in the utilization of ICT resources

Effective and efficient utilization of ICT resources at the workplace has a linear correlation to the level of ICT competence and proficiency of the users. This study investigated the respondents' level of ICT skills and applications. The responses were categorized into: basic skills, ICT integration at the workplace, use of Internet services such as e-mail, multimedia resources such as LCD projectors and mobile phone information services such as Mpesa and ZAP. The table below shows the number of users (above average) in each of the categories investigated:

Table 4.3: Competency in the utilization of ICT resources

Category	No. of respondents	% responses
Basic ICT skills	50	100
ICT Integration (at the level of 'Good') and above	42	84
Internet services	45	90
ICT equipment (mainly computers and multimedia pedagogy resources)	50	100
Mobile phone services	50	100

4.3.3   Basic ICT skills

All the respondents have basic ICT skills. that is. they are able to use and apply application programs such a MS Word, spreadsheets and power point in their work. For example, the principals use MS Word to compose and repackage general communication tools such as memos and reports. The Quality Assurance and Standards Officers (QASOs) are able to use spreadsheets to analyze quality assurance data whereas education officers can comfortably use computer application programs to plan and manage activities at their work stations. However, only a few respondents (only 10) were able to apply data base management skills. This can be attributed to the fact that database management is a highly skilled level of ICT only pursued as a distinct area of study. Thus most people focus on the application programs which they use in their day-to-day work activities.

4.3.4 ICT Integration

One of the advantages of Internet is the ability to access remote information sources and databases for research and educational purposes. A part from the basic ICT skills, a user is required to possess some Internet skills that will enable him/her to adequately explore the potential of the Internet in searching for information. From the table above, it is clear that majority of the respondents (90%) use the Internet services for communication purposes.

4.3.5:   ICT resources

There are various ICT resources available for communication. These include: computers, printers, LCD projectors and cameras (both still and digital). From the data presented in table 4.2, all the respondents utilize the ICT resources sampled for study. They use the e-mail service

to communicate with fellow staff. other educational clients. the parent Ministry headquarters and to print documents for communication at various levels at the work place.

4.3.6: Mobile phone services

The mobile phone has become central and a common denominator in the management of information and information-related services such as money transfer and short message services (popularly known as 'sms'). The mobile phone services were included in this study because they reflect ICT application in communication especially at a personal level. In some cases, the mobile phone has been used to disseminate information of educational nature. All the respondents use the various mobile information and communication services such as chat, e-mail, online communication and money transfer services.

There are four major mobile phone service providers in Kenya namely: *Safaricom, Airtel, Yu* and *Orange*. Table 4.4 below shows the responses to the use and reliability of the various mobile service providers, for example, network strength and speed.

Table 4.4: Reliability of mobile phone service networks in Kenya

Mobile service company	No. of respondents on range & reliability of services (Good)	% responses
Safaricom	46	92
Airtel	49	98
Yu	20	40
Orange	25	50

From the data above, *Airtel* is the most reliable network at 98 %, followed closely by *Safaricom.* This means *Airtel* and *Safaricom* mobile phone services are preferred compared to *YU* and *Orange* and this influences what service provider to use at the work place and also for personal

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communication. Most institutions have either *Safaricom* or *Airtel* lines integrated in their contacts alongside the landline phones.

4.3.7: Challenges faced when attending training at KESI

When asked to state whether they experienced any difficulties attending the training outside their institutions, the respondents stated the following reasons:

Table 4.5: Challenges faced when attending training at KESI

Reason	No. of respondents	% responses
Time constraints	50	100
Long distance of travelling	35	70
High travel costs	40	80

From table 4.5 above, all the respondents identified time as the major constraint they faced to attend training at KESI. This refers to the time they spent on the way to Nairobi and back to their work stations and thereby disrupting their routine duties. The long distance travelled means some of the participants arrived at the training venue already fatigued and therefore had little time to settle down given the short training period of one week. The respondents were also given an opportunity to give suggestions on where they prefer to have the trainings. The table below summarizes their responses to this question.

Table 4.6: Preferred training venue by the respondents

Training venue	No. of respondents	% responses
At the workplace	37	74
At regional center near work	48	96
At KESI Headquarters	15	30

From the table statistics, an overwhelming majority of the respondents (96 %) suggested they would prefer the training to take place at a regional center near their work place. They gave the twin reasons of time and costs for their choice of venue. It is instructive to note that KESI is a nationwide institution targeting trainees from all parts of the country. Given the poor transport and communication infrastructure, it is time wasting and costly to travel from up country to Nairobi especially if one is to spent a short period (one week) in Nairobi.

Conversely, only few respondents preferred the training to be conducted at KESI headquarters. Majority of the respondents were Education officers who opined that such trainings should be centralized and therefore KESI headquarters was the preferred venue.

4.3.8 Exposure to international education management courses

Table 4.7 depicts respondents' exposure to international education management courses. On exposure to international education management courses, it was noted that only 3.8% of the respondents had participated in international distance learning programmes which, fortunately, incorporated varieties of blended learning methodologies. This result may be a pointer to poor ICT skills, lack of time or simply "technophobia" as was shown in the use of discreet mobile phone applications above.

Fig. 4.7 Exposure to international education management courses

Key Indicators	Yes	No
(i) Participation in International Education Management Courses	3.8%	96.2%

4.3.9 : Strategies to improve courses and curricula delivery at KESI

The respondents were asked to state any two preferred study methods. Table 4.7 below shows the responses to the various study methods:

Table 4.8: Study methods

Study method	No. of respondents	% responses
Project	30	60
Case study	46	92
Problem solution	45	90
Face-to-face	18	36

From the table, the case study and problem solution methods were preferred by the majority of respondents at 92 % and 90%, respectively. Few respondents (36 %) were for the face-to-face method which KESI has been using predominantly. These responses point towards some form of self-study hence the practice of distance learning

From the data presented and the findings therein, there exists a number of challenges facing the capacity building activities at KESI. The next chapter provides suggested remedial measures by way of study recommendations.

4.4. Audit of KESI's current ICT infrastructure

4.4.1 KESI Headquarters

A critical examination of this ICT audit reveals that KESI has very limited ICT infrastructure. At the time of this research, the status of KESI's ICT infrastructure was as follows:

Table 4.9: KESI's current ICT infrastructure

S/No	Description of item	Quantity	Status
1	Computer Laboratory		
	Laboratory -1	40 desktop Computers	Computers yet to be networked
	Laboratory -2	20 desktop Computers	Computers yet to be networked
2.	ICT Policy Framework	1	Still undergoing editing
3.	System analyst/Web master	NIL	Yet to be recruited
4.	Local Area Network Connectivity	12 points	Functional
5.	ISP Source	1 Nairobi net: 256MB	Functional but slow
6.	Institutional website	1 - *kesi.ac.ke*	Functional
7.	Uninterrupted Power Supply (UPSs)	33 pieces	Functional
8.	Laptops	7 pieces	Functional
9.	LCD Projectors	15 pieces	Functional
10.	Medium Duty Printers	16 pieces	Functional
11.	Television Sets	6 sets	Functional-used for entertainment, not teaching

Furthermore, the KESI professional staff trainers are not trained in ICT technology *per se*. They only have basic manipulative computer skills learnt on the job. Consequently, the KESI management sources its ICT trainers from neighbouring institutions like KIE, KTTC, KISE and public universities. This scenario renders KESI's capacity to deliver its training curriculum through distance learning seriously wanting. The Institute, as it were, is not ready to take on this challenge. Instead, it requires major reengineering and inroads into appropriate distance learning technologies.

4.4.2 Field Connectivity and Networking Infrastructure

As mentioned at the beginning of this research. KESI is mandated to develop the managerial capacity of all personnel and stakeholders in charge of education administration and management by disseminating knowledge, skills and attitudes to the target groups through training. KESI's target groups include head teachers of primary schools; principals, deputy principals and heads of department of secondary schools, teacher training colleges and technical colleges; members of Board of Governors, School Management Committees; and field education officers. There are approximately 25 teacher training colleges, 20,000 primary schools countrywide, only 4,302 secondary schools, of which, 3,661 are public and 641 private (Sessional Paper No 1 of 2005). The greatest challenge with these huge numbers is the anticipated increased transition rate from primary to secondary schools. There is, therefore, need to address the anticipated increased transition rate by employing strategies for curbing impending challenges of staffing, infrastructure and learning materials. In this case, secondary schools become a priority in the integration of ICTs which are an alternative method of enhancing curriculum delivery in the midst of increased enrolment. Unfortunately, these education institutions across the country are poorly served in connectivity and network infrastructure.

The core problem in respect to this connectivity and network component is that Kenya lacks adequate connectivity and network infrastructure. As reported in the *ICTs in Education Options Paper* (2006), although a small number of schools have direct access to high-speed connectivity, through an internet service provider, generally, there is limited penetration of the national physical telecommunication infrastructure into rural and low – income areas. Consequently,

there is limited access to dedicated phone lines and high speed connectivity for e-mail and internet.

The *Education Management Information Systems (EMIS) Needs Assessment* survey (2005) indicated that over 70 percent of secondary schools and a much larger proportion of primary schools require functional telephones. Indeed, many parts of Kenya cannot easily get internet services because of the poor telephone networks. About 90 percent of Secondary schools need to establish standard Local Area Networks (LANs) in order to improve sharing of learning recourses. Alternative and appropriate technologies for access to the internet resources including wireless systems remain quite expensive. Indeed a small proportion of schools have direct access, through Internet Service Provider (ISP), to high speed data and communication system. Furthermore, very few schools in the rural areas use wireless technology such as Very Small Aperture Terminal (VSAT) to access e-mail and internet resources.

ICT in Education Option Paper (2006) acknowledges that the greatest and most widespread impediment to successful implementation of ICT for development in Kenya is the lack of access to connectivity to the internet. It notes that most of the available options for the effective use of ICT in support of education are much more powerful when activity is linked in a communication network that permits internet access to e-mail, administrative communication, file transfer and web site browsing. This element of the system adds value at every level of the education system. It enhances management performance through accelerating communication and it brings new dimensions to what can be accomplished under new objectives by bringing access to instruction and information resources to groups that otherwise would be excluded.

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4.4.3 Initiatives to Enhancing Integration of ICT in Schools.

Despite the problems enlisted above. several practical attempts have been made to facilitate enabling environments in secondary school for ICT integration. The government has enlisted the support of several agencies in the implementation of its ICT integration strategies in schools. In the 2009/2010, government of Kenya provided economic stimulus programme aimed at supporting use of ICT in teaching and learning. This concept proposes a holistic programme bringing together all key stakeholders for the successful implementation of ICT integration programme in educational institutions (schools and learning resource centres) country- wide. The goal of this proposed concept is to ensure that an end-to-end ICT integration solution is developed and implemented through strong partnership and ownership amongst all key parties listed in this programme. According to *Proposal for the Implementation of Economic Stimulus Funds Allocated for Computers for Schools in Constituency* (ICT Infrastructure) (2011), the objectives of this ESP concept are to: equip educational institutions (most preferably secondary schools) in all constituencies able to provide a classroom which can be used as an ICT Laboratory; develop and implement a comprehensive capacity building programme including teacher professional development and sensitization of key partners for effective use of ICT facilities in teaching and learning; supply digital materials to schools and community learning centres for use in teaching and learning; facilitate the establishment of a National Helpdesk and Support Centre to support schools on ICT integration issues and aspects; facilitate the establishment of a National Education Portal for sharing of digital content and enhanced collaboration amongst teachers, educationists and partners; and facilitate the management of the proposed programme at all levels.KESI can then build on this ESP programme as a platform to advance its distance learning agenda.

4.5 Cutting edge ICT tools available for pedagogical activities in training institutions

4.5.1 Definition of Cutting edge ICT tools

The concept of the Cutting Edge denotes a state of the art presentation which, in essence, is the highest level of development, as of a device, technique, or scientific field achieved at a particular time. It also refers to the level of development reached at any particular time as a result of the latest methodologies employed (Jakes 2006). Emerging technologies and converging technologies are terms used to cover various cutting-edge developments in the emergence and convergence of technology and refers to technology that is so new that it could have a high risk of being unreliable and may incur greater expense in order to use it. In ICT integration, some notable Cutting edge tools: include: Blogs (or Weblogs): Blogs are personal publishing tools; Wikis, which are collaborative publishing tools. Wikis enable the collaborative creation of content, with multiple authors contributing and editing content through a simple Web-editing interface. *Wikipedia* is an example of a world-wide application of wiki technology; Podcasts which are audio files (and sometimes other file formats) that are distributed through RSS technology and can be played on various types of players and computers, among others.

As a result of these tools, everyone can participate, and contribute in Web publishing. Everyone can be an information provider and an enabler of content being distributed or syndicated through RSS technologies, resulting in the active delivery of the information to the user. These tools take advantage of RSS (Really Simple Syndication) technologies. Users subscribe to RSS feeds, which deliver the information to an aggregator, a type of software that is similar to a mailbox. Aggregators collect the feed information and provide an interface for processing the content of multiple feeds from a single location. Aggregators may be online or may be resident on an individual's computer.

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4.5.2 Embedding ICT in teaching-learning

Embedding ICT in teaching-learning process is a major initiative in all branches of education: ICT has a particularly important role to play in developing provision for bilingual learners. This is concerned with exploring new ways of working with bilingual learners as well as facilitating more established techniques. The increased use of ICT to deliver and enhance aspects of educational provision is now an emerging practice for all learners belonging to rural and geographically remote and mainly monolingual areas thus having advantages in overcoming geographical barriers. For example video conferencing facilities developed to enable isolated learners to share learning with others in remote areas can also be used to reduce linguistic isolation by allowing same first language learners to discuss and communicate remotely.

Learners Support Services are an important part of Distance Education system. Since the learners in ODL system are not directly involved in the regular classroom teaching-learning process having direct interaction with the teachers regularly, they are provided with adequate Learners Support Services.

Such support services include the pre-admission counselling, admission process, provision of study materials both in print media and audio visual forms, subject specific academic counselling, audio visual viewing facilities, participation in teleconferencing, ICT facilities for e-learning, library services, laboratory support facilities, academic career guidance, information services related to rules, regulations, procedures, schedules etc. The role of ICT to speed up the delivery of the support services has now become inevitable for the distant learners. It also considers the shift from mass produced generic resources to tailored, personalized support and

communications and sets this in the context of globalization of the economy and the changing

expectations of students as 'consumers.'

4.5.3 ICT and learner support

Distance and open education schemes that have until recently relied mainly on the mailing of

written materials, videos, cassette recordings, and radio or TV broadcasting techniques can be

augmented, enhanced or replaced by new on-line tools and technologies which have the power to

transform the learning environment. Technological developments are coming together which

offer the following benefits:

(i) Through the Internet and worldwide web, new and enlarged sources of information and

knowledge that offer teachers and students opportunities for self-development as well as

benefits from incorporation into classroom environments.

(ii) Through e-mail and other Internet related feedback mechanisms, greater opportunity to

reduce the isolation and time delay associated with distance education.

(iii)Through the extraordinary pace of software development, enriched teaching and learning

with enhanced graphics, interaction, animation and visualization.

(iv)Through lowering telecommunications bandwidth costs and emergence of enhanced

cable, wireless and satellite systems, greater opportunities for basic access, video

conferencing, on-line interactive learning, and live interaction with the central place of a

distance education programme.

(v) Through community access schemes, more potential to make the benefits of distance

education eventually available to lower income people and rural communities.

(vi) Sound pedagogical principles would increasingly dictate the need for a more interactive learning environment which was earlier difficult to achieve and also adds considerably to the remotest areas. But it was noted that its deployment requires expensive satellite resources as well as an expensive face-to-face lecture and broadcast system running in parallel.

(vii) Very Small Aperture Terminal (VSAT) satellite systems are increasingly seen as a powerful distribution mechanism for Internet based resources, with ready access to interactive learning tools and e-mail, especially when linked or packaged with key educational web-site sources, servers and services. VSATs can overcome many of the bandwidth/delivery speed, limitations of terrestrial systems, particularly in developing countries, and can be especially economic when deployed in an asymmetric multi-casting mode in which high-speed 'downlink' capability is combined with slower speed 'uplinking.'

4.6 How ICT can be integrated as a tool to enhance capacity building at KESI

This section deals with the 'masterplan' for KESI's ICT strategy. Since ICT micro and macro projects have been planned and executed by international organizations like UNESCO and IIEP, and African Development Bank (AfDB), it becomes very easy for institutions like KESI to pick an existing framework and customize their ICT masterplan according to their requirements. The masterplan below borrows heavily from the African Development Bank (AfDB) ICT prototype which has been replicated in many African countries. A project aiming at training education managers and providers at national level will require the following considerations:

4.6.1 The Project: KESI ICT hub and Centre of Excellence

To support the construction and equipping of a national ICT hub and Centre of Excellence, that will provide an academic teaching and research programme based on the recommended KESI curriculum, promotion of entrepreneurship and linkages to the Ministry of Education industry, and the establishment of a project management framework for lifelong learning.

Objectives

To develop and strengthen high level ICT knowledge, skills and experience in Kenya for promotion of distance learning, human productivity and global competitiveness

Rationale

All major national education and economic policy documents, such as Vision 2030, *Sessional Paper No. 1 of 2005, National ICT Strategy for Educations and Training* (2006). *E-government Strategy (2006)* policies, point to the key role higher education, research, science and technology and technical and vocational training must play in bringing about the structural economic changes advanced by Kenya.

Development Components

This proposed project has three development stages as detailed below:

Component 1: Construction and equipping

Component 2: Design and delivery

Component 3: Promotion of business development and partnerships

Table 4.10 ICT Integration Development Plan

Component	ICT Development Stages
Component 1	Construction and equipping of the Centre of Excellence. This component will support the construction and equipping of new facilities for the CoE on the site already reserved for the institution.
Component 2	Design and delivery of professional post graduate degree and research programme. This component will support the design and implementation of teaching, training and research programme based on a university curriculum that will have been identified in the collaboration.
Component 3	Promotion of business development and partnerships with public, private sector and ICT industry: This component will develop linkages with productive sectors and strengthen partnerships with private sector. It will facilitate opportunities for new business development, availability of venture capital to stimulate start-ups and provision entrepreneurship training in order to turn innovations into business.

Projected Benefits/Return on investments

(i) The Centre of Excellence will contribute to capacity building in Kenya in ICT areas

(ii) The linkage to productive sector component will develop an attractive environment for graduates through incubation in partnership with local and foreign companies which will assist them in creating their own business in the country and region and limit the brain drain which is rampant in Kenya.

(iii) The Centre of Excellence will have a significant impact on the development of the ICT sector and thus improve delivery of social services such as health, education and public services.

(iv). Overall, the development of the ICT sector will enhance the economic growth and improvement of the delivery of public services in the country and in the region.

Graduates are expected to be employed in public and sectors to design software and applications that are relevant to social sectors and manage large scale e-service projects.

(v) The growth in advanced skills will improve research and development in the areas of mobility, security and sectoral application that will have direct impact on the poor. The Centre of Excellence will enhance the competitiveness of Kenya and the region by facilitating her entry into the knowledge economy;

(vi) The Centre of Excellence will strive towards increased women participation in advanced ICT learning, teaching and research through wide information on its programmes and by encouraging qualified women to apply for admission in resonance with the new constitutional dispensation in Kenya.

4.6.2 Chapter Summary

This chapter analyses, presents and interprets the data collected during the research study. In this analysis, we have demonstrated the levels of ICT competence demonstrated by various cadres of education managers in the field; we have also identified KESI's ICT infrastructural capacity and outlined cutting edge ICT tools available for pedagogical activities in training institutions. The Chapter winds up with a suggested prototype ICT masterplan that can assist KESI achieve its ICT integration objectives.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION & RECOMMENDATIONS

This chapter highlights some of the key conclusions derived from the study findings as presented in the preceding chapter. The conclusions and recommendations will provide valuable feedback that will assist stakeholders in making informed decisions on the way forward to enhance the capacity building mandate of KESI through ICT integration.

5.1: CONCLUSIONS

5.1.1: ICT integration at the work place

Whereas majority of the respondents indicated they have basic ICT skills and utilize a number of ICT resources at their work place, a few of them use the institutional website for communication, both personal and official. Websites, especially institutional websites, provide useful and relevant information content that can enhance a worker's performance. Therefore, it can be concluded that majority of the institutions do not utilize their websites effectively. The apathy in use can also be attributed to the inchoate state of the institutional websites; they lack reasonable content that staff would find useful. From the interviews, it was also noted that most institutions have low bandwidth and thus their connectivity to Internet is unreliable. Individual staff members use Safaricom and other modems for connectivity and since the costs are high, they mainly use the Internet to check mails. This leaves a big gap in the utilization of other Internet resources such as video and multimedia tools.

5.1.2: Mobile Phone Services

No doubt that the mobile phone has become an 'a must' tool for communication that cuts across the rural and urban population segments. From the study findings where all the respondents own

mobile phones and use the money transfer service significantly, it can be concluded that the other information services offered through the mobile phone such as e-mail. chat and social media e.g. twitter, are not adequately utilized. Instructively. the mobile phone converges voice, data and video, thus it is a powerful tool for integrated communication including educational services.

5.1.3: Capacity building at KESI

The study findings indicate clearly that most trainees would prefer to attend the trainings at regional centers closer to their institutions geographically. The constraints of time and costs, compounded by fatigue and other travel associated challenges informed their choices. It can therefore be concluded that the training venue foe KESI capacity building should be changed or decentralized. Given the mentioned challenges, it can also be safely concluded that the trainings have not been effective enough to meet predetermined capacity building objectives.

Most of the trainings take about one week and from the findings, respondents suggested the training curriculum should be reviewed to have more content. This shows that the training has been condensed to take a shorter duration and this compromises quality of the training.

On the preferred mode of training, the study shows most of the respondents preferred the case study and problem solving methodologies. These two approaches not only give the trainees an opportunity to explore new pedagogical processes but also allows them to carry out their studies in different environments, thus the need to decentralize the trainings.

A number of challenges were identified by the respondents on curriculum delivery and the overall training quality at KESI. These challenges can be summarized as follows and they impact negatively on the capacity building objectives of KESI:

a) **Large clientele to serve**: KESI has a very large clientele to serve; that is, above 455,000 potential trainees. These clients cannot be reached out through F2F methods only.

b) **Inadequate Lecture rooms**: KESI has about 17 plain lecture rooms which are not fitted with acoustic facilities to support e-learning.

c) **Regional Centres**: KESI lacks regional training Centres to cascade capacity building programmes across the country.

d) **Trainers of Trainers**: The Institute does not have sufficient databank of Trainers of Trainers to conduct capacity building in regional centres.

e) **Poor mobilization of field collaborators**: KESI does not have close contact with field collaborators to support capacity building programmes

f) **ODL Curriculum**: Most KESI curricula are still in designed for face to face delivery methods. There's need to rework them to suit ODL delivery.

5.2 RECOMMENDATIONS

In light of the foregoing and based on the conclusions drawn from the study findings, the following recommendations are advanced to improve the quality and effectiveness of capacity building at KESI. These recommendations will also provide focus on the role of ICT in enhancing the training quality at KESI from the perspective of e-readiness and therefore e-learning approaches that are more dynamic and efficient.

1. There is an ardent need for decentralizing training and distribution of materials to rural areas to enable participants in remote areas access it. This prescription is a perfect advocacy for blended learning which incorporates three cardinal delivery strategies: face to face, online (and mobile telephony), and the print option.

2. KESI should incorporate e-learning delivery methods in the trainings. These ICT-powered learning and teaching methodologies will provide increased access to learning resources, sharing of resources remotely and provide the trainees with a platform for discussions and further research on areas of interest, both as individuals and also as 'interest groups'.

3. In order to improve delivery of training services, participants should converge at KESI headquarters for future face to face education management courses, even if the management blended the learning with distance training. Part of the reason for this response is the notion that a national meeting at KESI Headquarters would afford participants an opportunity to share experiences and consult their tutors for further information.

4. The Nairobi location (KESI headquarters) would also have a number of benefits to the learners as indicated in their responses. Key responses included:

- Having a serene environment, away from the hustles of workplace responsibilities.
- Nairobi is also home to many well equipped education management training centres like Kenya Institute of Education (KIE), Kenya Institute of Special Education (KISE), Centre for Mathematics and Science Teachers in Africa (CEMASTEA) and the Ministry of Education

Headquarters itself, where major reference materials and professional educational specialists can easily be accessed.

5. KESI should encourage the trainees to conduct further assessment at their workplace; that is, using the on job project method or case study method. Such studies are productive in nature since they are based on existing real life scenarios and the trainees have a common frame of reference that enhances their understanding of the subject of study. Also, the capacity building trainings are essentially designed to empower the trainees be better managers at their institutions. It therefore makes sense to allow them undertake projects that are relevant to the challenges they face at their institutions.

This study is not conclusive in itself. It is recommended the findings from the study provide useful entering behavior and insights that will rekindle the urge to carry out more studies on ICT integration tool improve the quality of education.

REFERENCES

African Development Bank Group (2010): Regional Information Communication Technology (ICT) Centre of Excellence Project. Retrieved 18th October 2011 from
http://www.afdb.org/en/projects-and-operations/project-portfolio/project/p-rw-iad-003/

Bajunid. I.A.(2002) Explorations of the Multiple Possibilities and Equifinality of Development Initiative in the transformation of societies: The Case of e-learning in Malaysia.

Best, W.J .and Khan, J.V. (2003). *Research in Education*. London: Pearson Education Inc.

Blurton, C. (2002). New Directions of ICT-Use in Education. Retrieved 7 October 2011) from
http://www.unesco.org/education/educprog/lwf/dl/edict.pdf;

Cook and Campbell (1979) cited in Colosi (1997) Research Methodology. Routledge. London

Garrison D.R & Anderson T. (2004) E-learning in the 21st Century: A Framework for Research and Practice. RoutledgeFalmer. London

GeoSINC International (2002). e-Readiness Guide: How to Develop & Implement a National e-Readiness Action Plan in Developing countries. Retrieved 21st August 2011 from
http://www.apdip.net/documents/evaluation/e-readiness/geosinc01042002.

Government of Kenya (2006). National ICT Strategy for Education and Training. Nairobi: Government Printer.

Government of Kenya 1, (2005). Kenya Education Sector Support Programme 2005-2010. Nairobi: Government Printer.

Government of Kenya 2, (2005) Sessional Paper No.1 of 2005, on a Policy Framework for Education, Training and Research. Nairobi: Government Printer.

Government of Kenya, (2001). National Development Plan 2002-2008. Nairobi: Government Printer.

Government of Kenya, (2004). E-Government Strategy. Nairobi: Government Printer.

Government of Kenya, (2006). Ministry of Education Strategic Plan (2006-2011). Nairobi: Government Printer.

Government of Kenya, (2006). National ICT Policy. Nairobi: Government Printer.

Government of Kenya. (2007). Primary Schools Management Module. Nairobi: Government

Government of Kenya, (2011) Proposal for the Implementation of Economic Stimulus Funds Allocated for Computers for Schools in Constituency (ICT Infrastructure) Nairobi: Government Printer

Gutterman et al (2009) White Paper Information & Communication Technologies (ICT) in Education for Development. Retrieved, September 17, 2011

Jakes D.(2006) Instructional Technology Coordinator, Community High School Retrieved, September 17, 2011 from http://jakespeak.blogspot.com/

Janssens-Bevernage A., Cornille B. & Mwaniki N. (2006). Integrating ICT in Teacher Training: Reflections on Practice and Policy Implications - A Case Study of the Learning Resource Centre at the Kenya Technical Teachers College. Retrieved 15 October 2011 from http://web.idrc.ca/fr/ev-93060-201-1-DO_TOPIC.html

Jonassen & Reeves (1996) Learning with Computers: Computers as Cognitive tools cited in Johansen (Ed) Handbook of Research for Educational Communications and Technology. New York: Macmillan Library Reference.

Jensen, M. (2002). "Making the Connnection: Africa and the Internet, Current History", A Journal of Contemporary World Affairs, 99(637), 215-220.

Juma (2005) The Establishment Of A Higher Education Open and Distance Learning Knowledge Base for Decision Makers in Kenya. Undocumented website.

Kainth and Kaur (2006), Integration of ICT in Teacher Education. Retrieved 15 October 2011 from http//www ifets.info/journals/8_2/8.pdf.

Kelley et al (2003) Good Practices in the Conduct and Reporting of Survey Research

KESI Training Reports (2007, 2008 ,2009 &2010). Unpublished Training Reports

KESI Strategic Plan (Revised 2009). Unpublished Strategic Plan

Laferriere, T. (1999) Benefits of Using ICTs for teaching in K-12/13 Classrooms: report for School Net Program, Industry Canada. Retrieved October 17, 2011 from http://ww. School Net.ca/snab/e/reportsd/benefits.pdf

Moore and Kearsley (1996) Distance Education: A Systems View. Wadsworth Publishing Company.

Mugenda, O.M. and Mugenda. A.G. (2003). Research Methods: Quantitative and Qualitative Approaches. Nairobi: ACTS Press.

Ng, W. F. Miao & Lee, M. (2010). Capacity Building for ICT integration in Education, Digital Review of Asia Pacific 2009-2010 Capacity-building for ICT integration in education http://www.digital-review.org/uploads/files/pdf/2009-2010/capacity_building.pdf?93d8e68695e76f3bf28837adbeb3725c=a67935d4c62d2833579b626 17ad6ff79

Omwenga E.I. (2004). "Pedagogical Issues and E-learning Cases: Integrating ICT's into Teaching and Learning Process". Unpublished seminar paper. University of Nairobi. Retrieved 10th July 2011 from http://www. uonbi.ac.ke

Oblinger (2005) . Net Generation Learners Retrieved 15th October 2011 from http://www.educause.edu/netgenerationlearners

Owens L.K. (2002)." Introduction to Survey Research Design" Retrieved from http://www.srl.uic.edu. 8th May 2009

Orodho (2005) , Techniques of Writing Research Proposals & Reports in Education and Social Sciences. Halifax Printers, Nairobi

Oyomno, Z.G. (2006). "National Digital Indicators and E-Government Models for Africa: A Conceptual and Theoretical Foundation". In Outa et.al. (Eds). Mainstreaming ICT Reasearch Perspectives from Kenya, Nairobi: MvuleAfrica Publishers.

Parisot (1997) cited in Vivian (1998). Policy Development for Distance Education. ERIC Digest. Retrieved 15th October 2011 from ttp://www.ericdigests.org/1999-2/policy.htm

Pelgrum, W.J. and Plomp, T. (1993). The IEA Study of Computers in Education: Implementaiton of an innovation in 21 Education SystemsOxford: Pergamon Press.

Rahman R.A.(2009). "E-Learning Initiatives in Malaysian Schools". Retrieved from http://gauge.u-gakugei.ac.jp/apeid/apeid04/country_papers/malaysia.pdf

Ramdoo G. (2009) Policy Deficit in Distance Education: A Transactional Distance Retrieved 15th October 2011 from http://www.irrodl.org/index.php/irrodl/article/view/702/1326

Republic of Kenya Gazette (1998). Legal Notice No. 565. Government Printer, Nairobi.

Spears & Tatroe (1997) cited in Vivian (1998). Policy Development for Distance Education. ERIC Digest. Retrieved 15th October 2011 from ttp://www.ericdigests.org/1999-2/policy.htm

The Commonwealth of Learning, (2009). "An Introduction to Open and Distance Learning." [Online] 15th October 2011 from http://www.col.org/ODLIntro/ODL.htm

Tinio V. L. (2006) ICT in Education. Retrieved 10th July 2011 from http://www.apdip.net/publications/iespprimers/eprimer-edu.pdf

UNESCO, (2002). EFA Global Monitoring Report 2002. Education for All: Is the World on Track? : UNESCO Publishing.

UNESCO (2004) Technology in Schools: Education, ICT and the Knowledge Society

UNESCO (2005): ICTs and Education Indicators: Suggested core indicators based on meta-analysis of selected International School Surveys

UNESCO (2006): ICTs and Education Indicators: Suggested core indicators based on meta-analysis of selected International School Surveys

USAID, (2005). *ICTs in Education Options Paper*. Nairobi: Ministry of Education

Vivian (1998). Policy Development for Distance Education. ERIC Digest. Retrieved 15th October 2011 from ttp://www.ericdigests.org/1999-2/policy.htm

Wang B, Ya-hui Y, Zhi-lin. D & Xiao-dong L. (eds.) (2001) The Principles for Designing E-Commerce Websites, China Financial and Economic Publishing House, Beijing,

Other Websites visited
http://www.unesco.org/education/educprog/lwf/dl/edict.pdf. Retrieved 9th October 2011

http://en.wikibooks.org/wiki/ICT_in_Education/Definition_of_Terms. Retrieved 9th October 2011
http://en.wikipedia.org/wiki/Constructivism_%28learning_theory%29 Retrieved 9th October 2011
http://www.digital-review.org/uploads/files/pdf/2009-2010/capacity_building.pdf?93d8e68695e76f3bf28837adbeb3725c=a67935d4c62d2833579b626 17ad6ff79 dd. 10 august 2010

http://en.wikibooks.org/wiki/ICT_in_Education/Key_Challenges_in_Integrating_ICTs_in_Education

APPENDICES

Appendix I

A Letter of transmittal of data collection instruments

Robert Olodo

University of Nairobi

P.O. Box 92

Kikuyu

Dear Sir/Madam,

I am a student at the University of Nairobi undertaking a Master of Distance Education degree course. I am carrying out a survey on the factors affecting ICT Integration in training programs. This is to request you to fill in the questionnaire to the best of your knowledge. The information that you will provide will be treated with utmost confidentiality and will ONLY be for research purposes.

Thank you

Robert Olodo

Appendix: II:

Questionnaire on Integration of ICT in Education

Dear Respondent,

The purpose of this questionnaire is to find out your ICT knowledge, skills and experiences in communication and learning. This research aims at generating information that will be used in improving the teaching of education management courses for institutional managers and field education officers in Kenya, by understanding the factors affecting ICT Integration in training programs. In order to facilitate this study, you have been selected as one of the persons to provide the information required. Please read the instructions for each section carefully before you provide the answers. The accuracy of the research depends heavily on your honest and sincere response to the items. You are assured that the information you provide will be used for academic purposes only and will be treated with utmost confidentiality. Thank you for your cooperation.

Section A: Background Data

Please respond to the following questions:

1. Job designation (e.g. Principal, Education Officer, Assistant Director of Education, Quality Assurance and Standards Officer, Senior Assistant Director of Education, etc.) _____

2. How long have you served in this position (*in years*)? _____

3. Highest academic qualifications: *(tick appropriately)*

Diploma	Higher Diploma	Bachelors	Masters	PhD
☐	☐	☐	☐	☐

Section B: KESI Training Policy

1. (a) State which KESI Course(s) you have attended, corresponding year of attendance and duration. (*Select from list below*).

S/No.	Course title	Year attended	Course Duration
01	Results Based Management (RBM)		
02	Strategic Management and Planning		
03	Project Management		
04	ICEM for Principals, Deputies & HODs of Secondary Schools		
05	ICEM for Primary Schools		
06	ICEM for Quality Assurance Officers		
07	ICEM for Education Officers		
08	Teachers' Proficiency Test (TPC)		
09	Senior Management Course for Principals,& Deans of TTCs		
10	BoG/SMC/ DEB Sensitization course		
11	Integration of ICT in Education		
12	Free Secondary Education (FSE)		
13	Guidance & Counselling Sensitization		
14	The Art of School Leadership		

(b) Did you experience any difficulty attending the course(s) outside your station?

Yes/No _____

(c) If yes, explain briefly._____

2. (a) Where would you prefer to take your KESI courses in future? (*Choose one option only*)

☐ At my workplace

☐ At my regional centre, near the workplace

☐ At KESI Headquarters in Nairobi

☐ Other *(specify)*.

(b) Briefly give reasons for your choice _____

3. Choose suitable strategies for improving your course from list below: I prefer studying by:

(Choose any two main methods you consider suitable)

☐ Project method

☐ Case study method

☐ Problem solution method

☐ Face-to-face contact

☐ Other methods *(please explain briefly)*_____

4. (a) Have you ever participated in an online study programme with a foreign institution,

eg. *UNISA, inWent, Global Learning Portal (GLP)* etc?

Yes/No_____Year_____Institution_____

(b) Which course did you undertake?_____

(c) Briefly describe how the course was delivered; e.g. by module, face-to-face, blended learning, online, etc._____

5. Suggest other ways in which KESI training programmes can have bigger impact.

Section B: ICT Infrastructure & Staff Capacity

1. What Information Communication Technology resources do you have at your workplace?

(Choose from table below (use a tick). stating how you use them).

S/No.	Resource	Educational use	Official communication	Personal use	Other *(please specify)*
i)	Landline telephone				
ii)	Mobile phone				
iii)	Fax machine				
iv)	Desktop computer				
v)	Laptop computer				
vi)	Internet connectivity				
vii)	Institutional Website				

2. (a) Is your workplace served with main-line electricity supply? Yes/No_____

(b) If your answer is No. state your alternative source of electrical power_____

3. (a) Have you attended a computer course? Yes No.

(b) If yes. state the level (e.g. certificate. diploma, degree, etc _____

1. Below is a list of Information Communication Technology resources and applications. State how familiar and comfortable you are when using them. Please tick (√) your answer in the appropriate box.

S/NO.	ICT SKILLS &	LEVEL OF ICT SKILLS				
		Poor	Average	Good	V. Good	Excellent
		1	2	3	4	5
1.	BASIC ICT SKILLS					
	a) Word processing					
	b) Spreadsheets					
	c)PowerPoint Presentation					
	d) Database Management					
2.	ICT INTEGRATION					
	a) Using search engines					
	Multimedia applications					
3.	E-MAIL					
	a) E-mail with fellow staff					
	b)E-mail with educ. clients					
	c)E-mail with MoE Hqs.					
	d) Online communication					
4.	ICT RESOURCES					
	a) Desktop Computers					
	b) Laptop Computers					
	c) Printers					
	d)Mobile modems for e)Internet					
	f)LCD Projectors					
	g)Digital Still Cameras					
	h) Digital Video Cameras					

5.	MOBILE PHONE APPLICATIONS					
	r) Short Message Service					
	s) Chat					
	t) e-Mail					
	u) Online Communication					
	v) M-pesa banking service					
	w) ZAP banking service					
6.	OTHERS (not specified above)					

2. List major mobile phone service providers/networks that are operating in the region around your workplace and their reliability of service (eg. Good network, faster service, etc).

Mobile phone company	Reliability of service			
	Poor	Good	Very good	Excellent
e.g. Safaricom				
Airtel				

3. What do you understand by the term 'Integration of ICT in Education'?

_____

_____

_____

Have you been trained in any course associated with Integration of ICT in Education?

Yes/No----------Briefly explain--- --

Thank you for responding to this questionnaire

Appendix: III

SCHEDULE FOR INTERVIEWS AND FOCUS GROUP DISCUSSIONS

1. The main training approaches used in capacity building at KESI

2. Level of ICT integration in capacity building has been attained at KESI

3. The cutting edge ICT tools available for pedagogical activities in training institutions

4. Integration of ICT as a tool to enhance capacity building at KESI.

Appendix: IV

LIST OF SAMPLED INSTITUTIONS

S.No.	Institution	District	Province	Officer's Designation
1	District Education Office	Sotik	Rift valley	QASO
2	District Education Office	Keiyo South	Rift valley	QASO
3	District Education Office	Trans Nzoia West	Rift valley	QASO
4	District Education Office	Molo	Rift valley	QASO
5	District Education Office	Keiyo	Rift valley	QASO
6	District Education Office	Sotik	Rift valley	QASO
7	District Education Office	Keiyo South	Rift valley	QASO
8	District Education Office	Trans Nzoia West	Rift valley	QASO
9	District Education Office	Molo	Rift valley	QASO
10	District Education Office	Keiyo	Rift valley	QASO
11	District Education Office	Nakuru	Rift valley	QASO
12	District Education Office	Konoin	Rift valley	EO
13	District Education Office	Eldoret West	Rift valley	EO
14	District Education Office	Sotik	Rift valley	EO
15	District Education Office	Eldoret West	Rift valley	EO
16	District Education Office	Sotik	Rift valley	EO
17	District Education Office	Eldoret West	Rift valley	EO
18	District Education Office	Keiyo North	Rift valley	EO
19	District Education Office	Sotik	Rift valley	EO
20	Patel Day Secondary	Nakuru	Rift valley	SEO
21	Kaliyet Secondary	Eldoret East	Rift valley	SEO
22	Chester Girls Secondary	Pokot Central	Rift valley	SEO
23	Kipchimchim Secondary	Kericho	Rift valley	SEO
24	Jomo Kenyatta High School	Nakuru North	Rift valley	SEO
25	St. Benedict Kapkimolwo Sec.	Bomet	Rift valley	SEO
26	Cheborge Boys Secondary	Buret	Rift valley	SEO
27	St. Thomas Kongoli Secondary	Trans Nzoia East	Rift valley	SEO
28	Koibeiyon Secondary	Bomet	Rift valley	SEO
29	Kimose Secondary	Koibatek	Rift valley	SEO
30	Kapkeben AIC Girls Secondary	Nandi South	Rift valley	SEO
31	Boma Secondary	Trans Nzoia West	Rift valley	SEO
32	St. Teresa's Sikhendu Secondary	Trans Nzoia West	Rift valley	SEO
33	Cheborge Boys Secondary	Buret	Rift valley	SEO
34	Geta Secondary	Trans Nzoia East	Rift valley	Principal
35	St. Monica Girls Secondary	Trans Nzoia West	Rift valley	Principal
36	Nyakinywa Secondary	Trans Nzoia East	Rift valley	Principal
37	St. Teresa's Sinyereri Secondary	Trans Nzoia East	Rift valley	Principal
38	Kipsoit Mixed Day Secondary	Baringo	Rift valley	Principal
39	Wakulima Secondary	Uasin Gishu	Rift valley	Principal
40	Baringo High	Koibatek	Rift valley	Principal
41	St. Maurice Secondary Lunyu	Kwanza	Rift valley	Principal

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42	Makimenyi Secondary	Bomet	Rift valley	Principal
43	Bomet Boys Secondary	Bomet	Rift valley	Principal
44	Bomet Girls Secondary	Bomet	Rift valley	Principal
45	Mugurin Secondary	Mogotio	Rift valley	Principal
46	Chepalungu Secondary	Bomet	Rift valley	Principal
47	Bomet Mixed Secondary	Bomet	Rift valley	Principal
48	Poror Secondary	Koibatek	Rift valley	Principal
49	Saos Secondary	Koibatek	Rift valley	Principal
50	Marakwet Boys Secondary	Marakwet	Rift valley	Principal

16 were Principals of High schools, 15 Education officers, 8 Senior Education Officers and 11 Quality Assurance and Standards Officers.