E-LEARNING READINESS AND E-LEARNING ADOPTION AMONG PUBLIC SECONDARY SCHOOLS IN KISUMU COUNTY, KENYA

BY

CHARLES OTIENO OJWANG

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SUPERVISOR

DR. KATE LITONDO

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DECLARATION

I, the undersigned, hereby declare that this research project is my own original work and that all sources have been accurately reported and acknowledged, and that this document has not been previously, in its entirety or in part, submitted at any university in order to obtain academic qualifications.

SIGN........................ Date:.9/11/2012

CHARLES OTIENO OJWANG

This project report has been submitted for examination with my approval as the universitysupervisor.

Signed .... Date........9/11/12.........

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ABSTRACT

This study sought to investigate the status of E-learning readiness in public secondary schools in Kisumu County given the agreement by educators and policy makers across the world on the importance of ICTs to the future of education. There is also a policy emphasis by Ministry of Education on ICT integration into education and training systems in Kenya. The main objective of the study was to investigate the effect of e-learning readiness on e-learning adoption in secondary schools in Kisumu County, and specifically to assess the level of preparedness of public secondary schools in Kisumu County to implement E-learning so as to enhance access, equity and quality in secondary education. The study revealed that public secondary schools in Kenya lack adequate ICT infrastructure and connectivity to support effective E-learning delivery. The schools are facing various challenges which can make E-learning very difficult to implement, only 11.6% of the school confirmed that they get relevant E-learning materials while 45% confirmed that they were not receiving relevant material from the internet. 45% of the schools confirmed availability of internet in the schools but only 14.8% of the internet is reliable to support e-learning. The region has frequent power outage with 68.1% of the respondent acknowledging that they experience more than 3 times power outage in a month on average. According the respondents, only 6.7% of them were very ready to roll out the e-learning program in the school. The researcher recommends a consistent students and teachers exposure to e-learning devices to increase their level of e-learning readiness by increasing computers contact hours including weekends and further investments in ICT infrastructure by the school. The frequent power outage that hinders e-learning readiness in various schools can also be reduced if the schools invest more on power back-up systems and alternative power sources.

Key words: E-learning, readiness, adoption

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CHAPTER ONE: INTRODUCTION

1.1 Background Of The Study

There is great improvement in Information and Communication Technology (ICT) implementation in education in Africa as a whole as Farrell, Glen and Shafika (2007) observed in the African countries they surveyed. SouthAfrica is clearly outstanding in Africain terms of being able to move its ICT agenda forward. On the other hand, countries of North Africa that have both resources and high bandwidth connectivity with Europe have also been able to make excellent progress in implementing their ICT plans. This is clearly articulated in the work of Shafika et al(2007).

Farrell, G. and Shafika I. (2007)acknowledge that Kenya as one of the African countries has also made remarkable progress putting in place an ICT policy framework and implementation strategy complete with measurable outcomes and time frames. The process has had the benefit of sound advice from officials and stakeholders and, perhaps more importantly, strong leadership from the office of the Permanent Secretary of the Ministry of Education. He further observes that universal implementation is challenging given the lack of resources, national ICT infrastructure, and even electrical supply – particularly in the rural areas. The researcher has also noted other silent yet important challenge which is the level of computer literacy among teachers in our schools.

1.1.1 E-Readiness And E-Learning

E-learning readiness can be define as the state of being ready or prepared to roll out the e-learning program. There are various determinant factors of e-learning readiness which include the technical skills of the implementers, the attitude of both the teachers and the students towards the e-learning programs, the content to be delivered via the e-learning infrastructure and more importantly the budget allocated for the e-learning program.

Naidu (2003) defines e–learning asthe intentional use of networked information and communications technology in teaching and learning, he further adds that the term e-learning comprises a lot more than online learning, virtual learning, distributed learning, networked or web-based learning. The letter "e" in e-learning stands for the word"electronic",therefore, e-learning incorporates all educational activities that are carried out by individuals or groups working online or offline, and synchronously(students and teachers interact face to face) or asynchronously(students and teachers communicate via a media e.g. internet) via networked or standalone computers and other electronic devices.E-learningrefers to learning supported by the Web. It can take place inside classrooms as a support toconventional teaching, such as when students work on the Web during class. It also can takeplace in virtual classrooms, in which all coursework is done online and classes do not meetface to face. Clark & Mayer (2003) on other hand defines E-learning as instruction delivered via a computer that is intended to promote learning. Some scholars have a more restrictive definition of e-learning for example Jones (2003) definese-Learning as content delivery via the Internet.

The broader definition, which was used for the purposes of this project,included the use of the Internet, intranets/extranets, audio- and videotape, satellite broadcast, interactive TV, Compact Disc Read Only Memory (CD-ROM) and other storage media, not only for content delivery, but also for interaction among teachers, students and all stakeholders.Huynh et al (2003) identified that technological advancement has been the major inspiration for e-learning, beginning with the integration of radio broadcasting in the 1920's. As time goes by, more and more people gain access to the internet, this is observed by Huynh et al (2003) where they indicate thatas the cost of computer ownership decreases, the overall computer literacyincreases. These trends provide educational institutions an ideal channel for the delivery of educational content.Romiszowski (2004) further observes that e-learning presents an entirely new learning environment for students, thus requiring a different skill set to be successful this further acknowledged by the New Media Consortium (2007) where they add thatcritical thinking,

research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through.

E-learning has various benefits in the society as a whole, one of the greatest benefits is that the students are more engaged and are able to develops skills faster than the traditional method of teaching, teachers on the other hand also have more reference areas and will give the students their best. The communities will also benefit from the digital divide and even the economically disadvantage students and children with disabilities will benefit particularly in accessing learning materials from different part of the world. The economic progress can results from direct or indirect job creation in the line of e-learning as well as from developing a better educated workforce. E-learning will also encourage the students to decide on their own style of learning as it will involve the students individually in their learning process.It also improves learning in schools because they spend more time working at or practicing the skills being studied and tested. Many pupils enjoy using computers and one benefit of computers may also be the combination of such motivation and the increased practice at particular tasks. Computers can therefore help by increasing the amount of time pupils spend on particular activities, by increasing pupils' motivation and engagement when doing these activities and by providing practice at an appropriate level. Cecilia A. Mercado (2008), summarizes all these by her statement that goes "regardless of the degree of adoption, a successful e-learning endeavor must always involve a systematic process of planning, designing, developing, evaluating and implementing an e-learning environment where learning and teaching is actively fostered and supported".

E-learning also has numerous challenges, one of them include lack of customization to student's interestwhich makes its penetration becomes more challenging. It also requires heavy initial investment with a lot of return uncertainty because for good and successful e-learning, you require skilled manpower, good and efficient infrastructure and the right software. The amount of time

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required to develop and maintain good e-learning course is enormous and this also gives a serious challenge to the implementation and even sustainability of e-leaning.

1.1.2 Public Secondary Schools In Kisumu County

Kisumu Countyhas a total of 153 public secondary schools as can be seen from appendix I. Most of the secondary schools in this County are Mixed and majority which are either for boys or girls prefer boarding to day program. The performance of the public secondary schools in this county has not been encouraging and has been a serious concern to both politicians and stakeholders.

1.1.3. Kisumu County

Kisumu County is one of the 47 counties in Kenya, it is located in the western part of the country bordering Vihiga County to the North, Nandi County to the North East, Kericho County to the East, Nyamira County to the south, and other neighbouring counties include Homa-bay and Siaya. It has approximate area of 2085.9 km^2 and a population of 968,909 with a total male population constituting 48.9% while the female 51.1%, this is according to 2009 Kenya population and housing census Report published in August 2010. It constitutes 6 constituencies namely Kisumu Town West, Kisumu Rural, Nyando, Muhoroni and Nyakach and has a total of 153 public secondary school as listed in AppendixI.

The County, which is created under the new constitutional dispensation with a city equipped with an ultra-modern newly expanded airport is expected to be not only nerve center for the entire Western Kenya, but a major commercial link center between Kenya and other landlocked African states in the Great Lakes region. The County of Kisumu is also situated in an area well known for its rice production. The rice is produced in the two schemes at Ahero and Kabonyo Rice Scheme.

1.2 Problem Statement

E-learning has been around for decades but it has seen exponential growth in the last years, mainly because of the growth of the Internet. Initially, the migration and adaptation of computer-based

instruction, based on mainframes to minicomputer, workstations and personal computers, absorbed much of the energy of researchers and developers. With each succeeding technological innovation, new capabilities and features became available to enhance the technological supported learning process. As the tools matured and personal computer proliferated, costs were dramatically reduced. Recent instructional content incorporate multimedia capabilities and sophisticated authoring features. These computer-based instructions are characterised by tightly bound instructional content and logic.

Kisumu County hosts Kisumu city which is the third largest city in Kenya after Nairobi and Mombasa and given it rapid economic growth, as can be justified from the National Economic Survey journal, the researcher found it compelling to also look at the e-learning readiness in the County. The County has also not been performing well in national examination in the national ranking. The question one could ask here is; could this be because of the lack of the use of computer to improve their performance? Could it be the e-learning content that they are exposed to that is not in harmony with the curriculum requirement? Could it be lack of expertise in this line of e-learning? Could we link this to students or teachers attitude towards e-learning? Or could this be attributed to poor e-learning adoption? These are burning questions the has guided the researcher in research question formulation.

A lot of research has been done in the area of e-learning,Look (2005) ascertains that the review of 219 studies on the use of technology in education consistently found that students in technology rich environments experienced positive effects on performance in all subject areas. In particular, Becta (2003) pointed out that ICT provide fast and accurate feedback to students, and speed up computations and graphing, thus freeing students to focus on strategies and interpretation. Further, use of interactive multimedia software, for example, motivates students and leads to improved performance. In fact, studies showed that more students finished high school and many more consider attending college where they routinely learned and studied with technology (Becta, 2003). Barak (2004) further revealed

that the use of ICTs in education promotes deep learning, and allows schools to respond better to the varying needs of the students.

Paris' (2004) work which involved 52 Year 10 students from South Australia, was a study to examine students' attitudes towards online web assisted learning (OWAL). Using data collected through questionnaires, one of the findings was that students showed a strong positive tendency towards OWAL compared to paper assisted learning that is the use of text. Mildred et al(2010) found out that non- New Partnership for Africa's Development (NEPAD) schools had better ICT qualified Head of Departments (HODs)than those from the NEPAD schools. This was because 67% of HODs from theNEPAD schools were holders of a certificate in ICT acquired after two weeks of in-service training as compared to 17 % in the non-NEPAD schools having a certificate after two years of training while the rest (83%) had either a diploma or degree in computer studies.

A 2003 survey commissioned by the Association for the Development of Education in Africa (ADEA) Working Group on Distance Education and Open Learning found out that while the Internet and CD-Roms were used in 35% of francophone institutions,only 5% of Anglophone and 0% of Lusophone institutions were using them.These results are somewhatskewed by the fact that universities in North Africa enjoy much better connectivity with Europe. Research conducted by SchoolNet Africa, the Commonwealth of Learning, and the International Institute for Communication and Development (2005) identified an estimated 61 different ICT-related teacher training and professional development programmes, projects, and courses under way in Africa.

The researcher has not come across a study that focuses on the level of e-learning readiness in public secondary schools in Kisumu County consequently this study filled this knowledge gap by attempting to answer the following research question; how ready are the public secondary schools in Kisumu County for e-learning program and how does this influence the e-learning adoption?.

1.3 Objectives of the study

The general objective is to investigate the effect of e-learning readiness on e-learning adoption in secondary schools in Kisumu County, specifically:

a)   To determine the extent of e-leaning readiness in public secondary schools in Kisumu County

b)   Toestablished the extent of e-learning adoptionin public secondary schools in Kisumu County

c)   To determine the influence of e-learning readiness on e-learning adoption in public secondary schools in Kisumu County

1.4 Value Of The Study

The information from the study is crucial to school management and all education stakeholdersbecause it can be used to assess how their e-learning investment has contributed to the quality of education and help them improve on some areas of weakness if any and maintain their area of strength.

Other stakeholdersfrom other schools who are planning or in the process of implementing the e-learning program will also benefit from this research by learning from other's challenges and improving on it before they incur avoidable costs.

Academically, the proposed study is expected to contribute to the existing literature in the field of e-leaning in general and its impact on quality education in particular. Besides, the study will be a basis for further research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

ICT is powerful in presenting or representing information in different ways. This can be through different forms (text and pictures or tables and graphs) which is always known as multimedia presentation or by enabling changes to be shown dynamically such as in mathematical modeling or by helping visualization of complex processes in science. According toUshaVyasulu (2006), ICT, does not only refer to the latest computer and Internet based technologies, but also to simple audio visual aids such as the transparency and slides, tape and cassette recorders and radio; video cassettes and television; and film.

2.2 E-Learning

Gunasekaran A et al. (2002) observes e-learning as just like any learning process, and it depends on effective communication of human knowledge, this can either be a face-to-face classroom or across the Internet. They further add that e-learning is also very effective in a case where there is a two-way communication between teachers and learners, and among learners themselves. Romiszowski A. (2004)attributesthechallenges of two-way(synchronized) tothewaythe e-learning concept wasintroducedhe argues that when e-learning was first conceived, it was widely promoted as a means of reducing costs by delivering pre-packaged content to large populations of learners by means of electronic networks or CD-ROMs. Such an approach relies on one-way communication from teacher to learner, attenuating the learning experience. This viewed learners as atomised individuals and fails to take into account the social context in which learning occurs.

Namahn(2002) views, e-learningas a tool to be used to foster interactive and collaborative engagement. This can be either synchronous or asynchronous: learners and instructors may either have regular, scheduled sessions whether they all 'meet' simultaneously online, or (more commonly) use

electronic forums to exchange ideas in their own time. The most familiar form of synchronous electronic communication is real-time two way text-based online chat, which is widely used in e-learning. Namahn (2002) further views synchronous instruction as not only the physical presence of the instructor and the student at the same place but can also involves a more sophisticated forms of synchronous instruction which include virtual classrooms, which use information and communication technologies to mimic a traditional classroom environment. This may involve video-conferencing or the use of shared electronic whiteboards, which allow learning materials to be created and modified in real time, either by the instructor or the learners.Ideally asynchronous instruction allows participants to control their own timetables and fit learning around their other commitments. This is a major bonus, especially for adult learners who lead complicated lives.Many of the technologies used in asynchronous e-learning also permit two way communication between learners and instructors, or multi-directional, collaborative communication among learners themselvesNamahn (2002).

2.2.1 Types Of E-Learning

In literature, various types of e-learning are described by using the criteria time and distance. Thefollowing table gives a brief overview of these 'types' of e-learning.

Table 1.0: Type of E-learning

	Near in place	Partly distant in place	Distant in place
Distant in time	Asynchronous e-learning. For example, taking a self-paced course, exchanging e-mail messages with a mentor and posting messages about a topic to a discussion group.		
Distant in time			Trainers and trainees nevermeet. For example, coursesare distributed via the internet and communication via e-mail only
Partly distant in time	Face-to-face training is combined with for example electronic conferencing within one organization or campus.	Trainers and trainees meet for a kick off, and for an evaluation. The learning goes on at a distance in time and place.	Trainers and trainees use for example IRC or other tools to communicate about a problem or the courseware.
Near in time	Synchronous e-learning: communication occurs at the same time between individuals and information is accessed instantly. For example, real time chats, audio or video conferencing.		
Near in time			Trainers and trainees do not meet physically, but by using for example a video conferencing system a course is given or students are able to ask questions.

Source:*Namahn(2002)*

The variations in the configuration of e-learning offerings can be described through a number of attributes, as listed in Table 1.0 above. The extent of e-learning technology use in course delivery varies widelyas can be seen from the above table. An e-learning course component can be described by indicating which one of the two attribute values from each dimension is applicable. E-learning can be synchronous (real-time) or asynchronous (flex-time). Synchronous e-learning includes technology such as video conferencing and electronic white boards (Romiszowski, 2004), requiring students to be present at the time of content delivery. Asynchronous applications include programmed instruction and tutorials that allow students to work through the screens at their own pace and at their own time. Most of the courses available on the Internet are based on this asynchronous model (Greenagel, 2002).

Students can be involved in e-learning from distributed locations, as in distance learning, or from the same place, such as using a group support system in a classroom to work on an assignment (Gunasekaran et al., 2002). E-learning applications also differ in the levels of collaboration that they involve. Some courses are entirely independent and individual, while others incorporate some elements of group learning such as discussion forums or chat rooms. The mode of course delivery can be entirely electronic (with or without an instructor) or take a more blended approach integrating electronic and classroom delivery to varying extents. Many current e-learning offerings follow the latter mode, taking advantage of the benefits of various types of delivery (Jack and Curt, 2001).

There are many critical steps in developing and executing a successful learning program according to the Radiant Systems, (2002). The first step is conducting a thorough analysis and developing a training plan which leads to the most efficient and effective learning solutions followed by a blended approach to training including classroom training, synchronous and asynchronous online training, and printed materials supports training for a widely distributed and changing audience. Step three is developing e-learning content that is interactive, relevant to the audience, and includes the whys as well as the how,

that will keep learners engaged and increase overall knowledge retention. Step four is marketing the e-learning through a variety of mediums which prepares and excites users for the new methods of training delivery. Step five is allowing adequate time for e-learning on the job and ensuring managers support this type of learning increases the completion rate for self-paced learning. Step six is tracking results and tying to performance reviews holds learners accountable no matter what delivery mode is selected. Step seven is providing adequate technical and operational support during training and after go-live for end users decreases frustration.

2.2.2 Trends of E-learning

E-learning has moved through a number of distinct phases – from Computer Based Training through to Learning Management Systems and Courseware Management Systems to now encompass an increasingly broad scope of applications and activity. Kerry B., Jon M.(2004) in their paper title "Trends and Issues in E-learning Infrastructure Development" indicated quitea number of factors with regard to mapping the evolving e-learning landscape. They started by noting that the ongoing development in dedicated e-learning software applications, commonly known as learning management systems (LMS) or managed learning environments (MLE) has evolved where many of the early LMS vendors now offer their LMS as one application within a suite of products. They further noted that e-learning is now facilitated by an increasing range of specialised e-learning applications within the wider infrastructure and is not necessarily delivered by managed learning environment such LMS. Much of this learning happens in context, for example 'just in time' in the workplace.

Kerry B., Jon M.(2004) further observed that Basic 'units of learning' or 'units of instruction' are beginning to shift away from the traditional course model (courseware) to typically smaller, more targeted, modules (learningware).Portals are widely adopted in e-learning and even publishers are now offering value added services to the e-learning market, they gave an example of McGraw-Hill who is offering a free Course Management System (PageOut) and Thomson Learning's TextChoiceprovides

easy access to digital content from which teachers can create custom learning materials. 'M-learning', or mobile learning, has become established as a significant area of research and development (e.g., through the European MOBILearn project). However, it also brings with it a new set of constraints that impact the design of e-learning content and applications despite the increasingly important role (and diversity) of Web-enabled repositories within e-learning technical infrastructure little learning object/courseware content is contained within them.

2.2.2 E-Learning Models

Reigeluth (1995) reports that the growing influence of postmodernism in academic culture (in the 1980s and 1990s) and the advent of the information age have called for a radical change in paradigms related to the way people are educated and trained, and have begun to influence instructional design with the rise of constructivist theories. As a result, the field of instructional design further evolved to consider student learning as a contextual experience, wherein socially affected learner cognition is a feature in learning; subsequently, a less objective and more subjective constructivist perception of learning has resulted in newer constructivist instructional design theory approaches in the 1990s (Jonassen, 1999, 2001). Being a polarized position to the systems view of instructional design, it has stirred a vigorous response from advocates of more traditional models (Dick, 1996; Merrill, 1996). Nonetheless, none of these models is adequate to meet the consequences of the paradigm shift from industrial age to information age (Reigeluth, 1999). As a result, instructional designers are faced with the challenge of forcing learning situations to fit an instructional design/development model rather than selecting an appropriate model to fit the needs of varying learning situations (Gustafson, & Branch, 2002).

An instructional design (ID) model provides procedural framework for the systematic production of instruction. It integrates basic elements of the instructional design process, including analysis of the intended audience and determination of goals and objectives, and may be used in different contexts. It prescribes how combinations of instructional strategy components should be integrated to produce a

course of instruction (Braxton, Bronico, & Looms, 1995). The effectiveness of a model is heavily dependent on the context in which it is applied; instructional design methods are situational and not universal. Instructional design models provide a systematic approach of implementing the instructional design process for a specific educational initiative (Morrison, Ross, & Kemp, 2004).

Figure 1: Anderson's Model of Online Learning
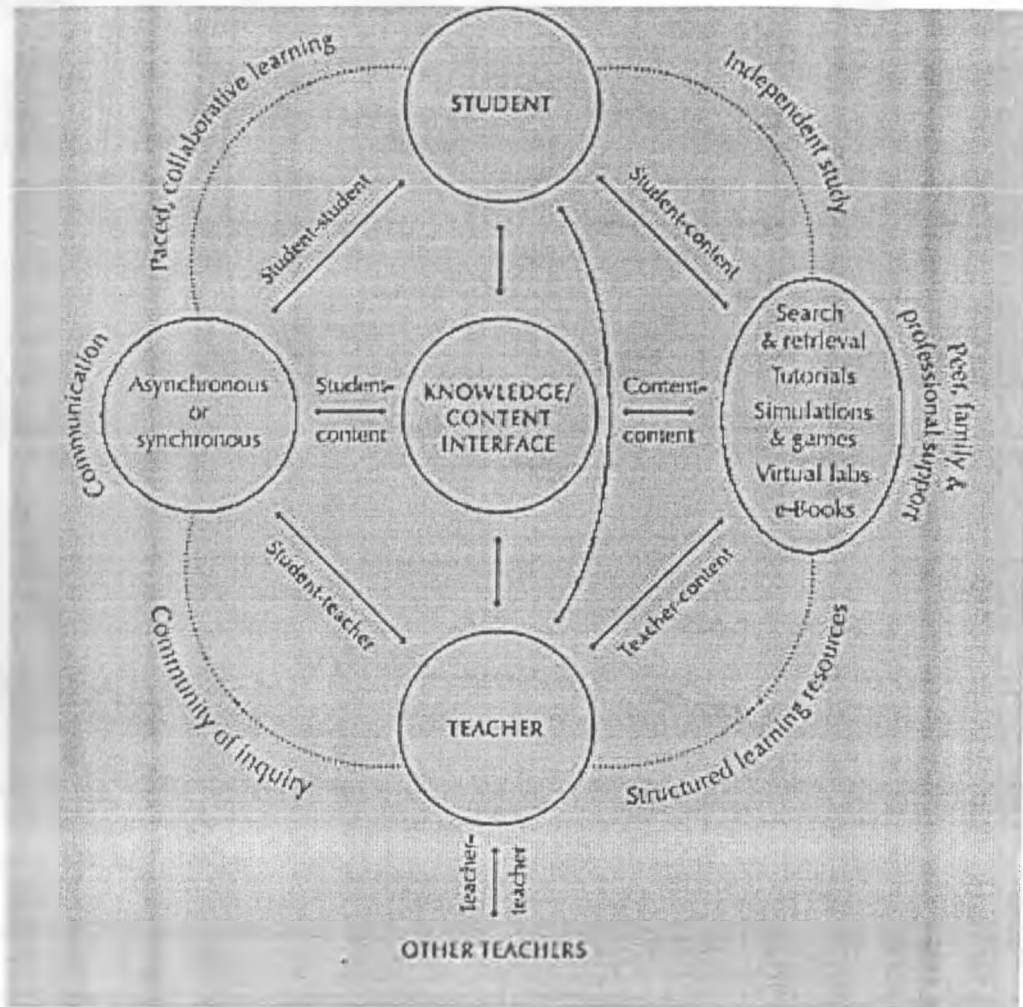
Source: Anderson, T., Elloumi 2004

The model is based on another interactive triad – the interactive possibilities among students, teachers, and content. This model describes the types of communication and interaction which produce multiple types of learning in an online setting (Anderson, T., Elloumi 2004).

Figure 2:Clark's Model of Instructional Systems Design
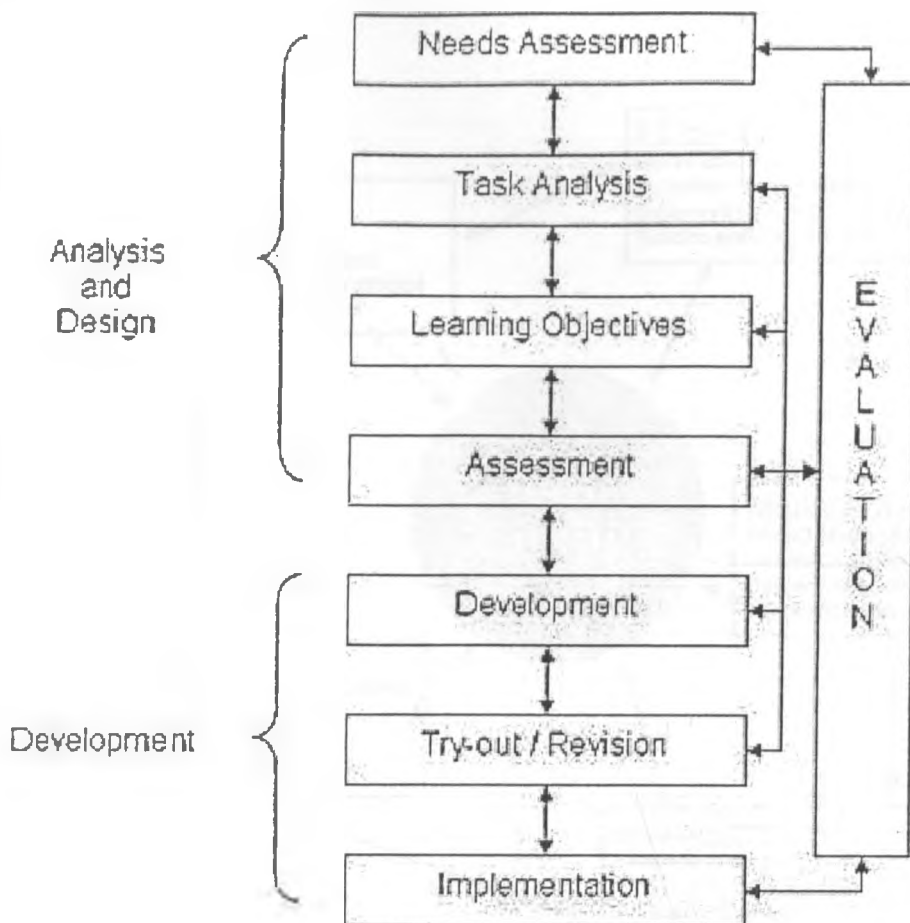
Source: Ruth Colvin Clark, *2005*

Ruth Colvin Clark, (*2005*) modifies the classic model of instructional design Model. This model uses the familiar "ADDIE" design sequence (analysis, design, development, implementation, evaluation). Clark updates this linear, industrial age view of instructional design by stressing the iterative and interactive nature of each step informed by frequent evaluations.

Figure 3: AECT's Model of Instructional Technology

Development
Print Technologies
Audiovisual Technologies
Computer-Based Technologies
Integrated Technologies

Utilization
Media Utilization
Diffusion of Innovations
Implementation and Institutionalization
Policies and Regulations

Theory Practice

Management
Project Management
Resource Management
Delivery System Management
Information Management

Design
Instructional Systems Design
Message Design
Instructional Strategies
Learner Characteristics

Evaluation
Problem Analysis
Criterion-Referenced Measurement
Formative Evaluation
Summative Evaluation

Source: Earle, R.,2000

The AECT's model shows the five domains of competencies which are the foundations of the theory and practice of educational communication and instructional technology. These five domains and the sub-domains are proposed as an outline of professional competencies for instructional technology and design (Earle, R., 2000).

Figure 4: Human performance Technology Model

Performance Analysis (Need or Opportunity)

Organizational Analysis (Vision, Mission, Values, Goals, & Strategies)

Desired Workforce Performance

Gap Analysis

Environmental Analysis
- Organizational Environment (Society, Stakeholders, & Competition)
- Work Environment (Resources, Tools, Human Resources Policies)
- Work (Work Flow, Procedure, Responsibilities, & Ergonomics)
- Worker (Knowledge, Skill, Motivation, Expectations, & Capacity)

Actual State of Workforce Performance

Cause Analysis

Lack of Environmental Support
- Data, Information, and Feedback
- Environment Support, Resources, and Tools
- Consequences, Incentives, or Rewards

Lack of Repertory of Behavior
- Skills and Knowledge
- Individual Capacity
- Motivation and Expectations

Intervention Selection, Design, and Development

Performance Support (Instructional and Noninstructional)

Job Analysis/Work Design

Personal Development

Human Resource Development

Organizational Communication

Organizational Design and Development

Financial Systems

Intervention Implementation and Change

Change Management
Process Consulting
Employee Development
Communication, Networking, & Alliance Building

Evaluation

Formative
- Performance Analysis
- Cause Analysis
- Selection/Design of Interventions

Summative
- Immediate Reaction
- Immediate Competence

Confirmative
- Continuing Competence (Job Transfer)
- Continuing Effectiveness (Organizational Impact)
- Return on Investment

Meta Evaluation/ Validation
- Formative, Summative, Confirmative Processes
- Formative, Summative, Confirmative Products
- Lessons Learned

Copyright 2004. The International Society for Performance Improvement HPT model is from page 3 of *Fundamentals of Performance Technology, Second Edition.*

All rights reserved. by D.M. Van Tiem, J.L. Moseley, and J.C. Dessinger, published by ISPI in 2004.

Source: The Immersion Program, 1999-2005

This latest version of the HPT model offered by the International Society for Performance Improvement follows the five basic steps to improve human performance: a performance analysis, cause analysis, selection of intervention, design and development, implementation and evaluation(The Immersion Program, 1999-2005).

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2.3 Challenges of E-leaning

In as much as Africa in general and Kenya in particular has made a significant step toward the e-learning concept, there are still some challenges that are hampering this effort. The first challenge is that of the number of internet service providers (ISP) licensed in Kenya is still not enough to manage the increase demand of the internet services more especially in the line of e-learning. The majority of the ISP are also targeting big towns and forgetting about the needy rural places. The software that can be used to introduce e-learning contents to the schools are also expensive and require specialized personnel to operate. Network security is also posing a big challenge to the e-learning because of the complexity involved in handling unauthorized access to e-learning materials and more importantly is the inconsistent supply of the internet service not only in rural areas but also in the urban areas of Kenya.

2.4 E-learning Readiness

Readiness is an English word which is defined in oxford dictionary as "the state of being ready or prepared, as for use or action". So e-learning readiness can be define as the state of being ready or prepared to roll out the e-learning program.

2.4.1 Determinants Of E-Learning Readiness

Critical success factors that can also be viewed as the determinants of e-learning readiness are varying as viewed by different scholars. Masoumi (2006) views critical success factors as those activities and constituents that must be addressed in order to ensure e-learning successful implementation.Chapnick (2000) grouped together a wide variety of factors into eight categories that allows practitioners to use the same process to assess the vastly different stakeholders in the system. The factors include psychological readiness, sociological readiness, environmental readiness, human resource readiness, financial readiness, technological skill readiness, equipment readiness and content readiness. Several

other studies in recent years have also highlighted critical aspects of readiness which include the technology access, technical skills and attitude.

2.5 Conceptual Framework

E-learning readiness influences the way schools adopts the e-learning process given that the school has to be ready by buying the necessary computer peripherals for it to start the adoption process. This involves laying down infrastructure both in terms of the hardware, software and even the skilled personnel for the school to embark on the e-learning adoption process, the level of readiness therefore is very important because it will direct the school on how to start the adoption process. This will again be directly influenced by the personal characteristics of both the implementers and even the students as a whole because the success of the process will depend on how they receive and integrate it within their traditional system.

School characteristics like the size, whether day or boarding, whether private or public will also play a fundamental role in the adoption process, this is because school vary in terms of policy implementation especially when we consider public or private schools.

E-learning readiness
-infrastructure
-Electricity
-Computers Resources
-Experienced personnel
-Internet Connectivity
-E-Learning awareness
  -level of computer
    literacy

Personal Characteristics
School Characteristics

E-learning Adoption
-e-learning content
-Use of e-learning in
various subjects
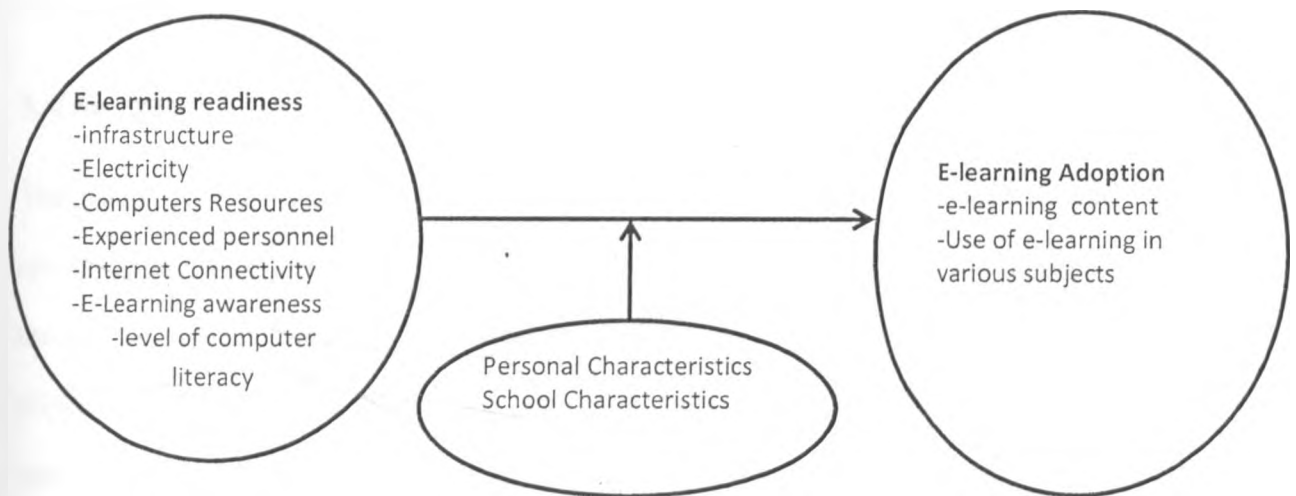
Source: Ojwang (2012)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The study was through a descriptive survey design to investigate level of e-learning readiness in public secondary schools in Kisumu Countyand the extent whiche-learning readiness affect the adoption process. The survey element was very instrumental in collecting statistical information on the knowledge and attitude of teachers and heads of schools towards e-learning concept. This research was considered appropriate as it deals with many members in a population where it is not possible to study all of them and hence calling for sampling in order to come up with generalizations and inferences about the whole population. Similar studies that had successfully used this research design are Ngatia (2000) and Ombati (2007).

3.2 Population

The population of this study was drawn from all public schools in Kisumu County as listed in the Kenya Open Data Website. There are total of 153public schools, the name of the schools are listed inAppendix I.

3.4 Sample

The sample of this study consisted of fifty (50) Public schools in Kisumu County. The fifty schoolswereselected from a sampling frame of one hundred and fifty three (153) sampling unit through convenient sampling. The researcher believes that this sample is enough to represent the population because it is a third of the population. Data for the study came from self-administered questionnaires which were distributed to 50schools, within each school the researcher administered 2 questionnaires one for the Head teacher, and one for the teacher in charge of ICTor with some knowledge of computer, so in total the researcher expected about 100 questionnaires. The sample

constituted 30% boys school 30% Girls schools and 40% mixed school. This enabled the researcher to get the mixed perception of these groups as far as e-learning readiness is concerned.

3.5 Data Collection

Primary data was collected by means of semi-structured questionnaires. Semi-structured in the sense that both open-ended questions intended to elicit qualitative responses about respondents views whilst closed ended questions intend to elicit quantitative data for statistical analysis. The questionnaire hadfour sections, section A dealt with general information of the participant and the organization. Section B; sought information on the extent of e-learning adoption in public secondary schools in Kisumu County. Section C; sought information on E-Learning ReadinessSection D; sought information on the challenges of e-leaning in public secondary schools in Kisumu County. This was in line with the objectives of the study. Piloting of the questionnaire was done to assist the researcher identify any ambiguous and unclear questions. The questionnaires wasdropped and picked later.

3.6 Data Analysis

Data was collected and analyzed using suitable statistical software in the market, to establish extent of e-learning adoption in public secondary schools in Kisumu County and challenges of e-leaning. Other relevant software like MS Excel werealso be used for establishing the descriptive statistics of the research. Both descriptive and inferential statisticswas used to analyze the result.

The Regression Model

$$y = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + e$$

Where y is the e-learning adoption

α_0 is the constant

x_1 is the e-learning readiness

x_2 is the personal characteristics

x_3 is the school characteristics

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSIONS

4.1 Introduction

This chapter covers data analysis, discussions and findings of the research. The data is summarized and presented in form of frequency, percentage, cumulative percentage and tables.

Data was collected from sampled public schools in Kisumu County,Kenya. Consequently, the collected data was analyzed and interpreted in line with the objectives of the study which included: To determine the extent of e-leaning readiness in public secondary schools in Kisumu County and also to establish the extent of e-learning adoption in public secondary schools in Kisumu County the analysis also sought to determine the influence of e-learning readiness on e-learning adoption in public secondary schools in Kisumu County. Out of 100 questionnaires distributed for this research, only 60 useablequestionnaires were returned giving a response rate of 60 per cent, which the researcher consideredsatisfactory for subsequent analysis.

4.1.1 Percentage Response Per School Type

Mixedschools had the highest number of response at 47.6 % followed by Boys schools at 25.4% and lastly girls schools at 23.8% as can be seen from the table below.

Table 2.0: Percentage response grouped by the type of school

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	3.2	3.2	3.2
	Boys	16	25.4	25.4	28.6
	Girls	15	23.8	23.8	52.4
	Mixed	30	47.6	47.6	100.0
	Total	63	100.0	100.0	

Source: Research Data

4.1.2 Availability Of Computer Lab

The researcher wanted to know how schools with computer lab and those without computer lab vary in various parameters per school category. The researcher found out that the average number of computers tend to be more in school with computer labs where boys school rank higher (13.44) followed by girls school(13.00) then Mixed(12.44). The ICT personnel are completely missing in schools without computer lab while the schools with computer lab only have an average of one in a school.

Table 3.0: The mean number of computer categorized by computer lab availability in the school

	School	Computer Lab Not Available			Computer Lab Available		
		School			School		
		Boys	Girls	Mixed	Boys	Girls	Mixed
	Mean	Mean	Mean	Mean	Mean	Mean	Mean
Number of Good Computers		1.43	2.83	2.43	13.44	13.00	12.44
Students Per Computer		.17	.00	.00	2.11	2.00	2.44
Printers		.83	1.00	1.07	1.11	1.00	1.31
Number of ICT Personel		.00	.00	.00	1.00	1.00	1.00

Source: Research Data

4.1.3 The Relationship Between The Number Of Student And The Number Of Good Computers In The School

The researcher wanted to know how the number of students in the school relates to the number of computers in good condition in the school. The researcher found out that the correlation is 0.367 and is significant at the level 0.01 as shown in the table below, but when the correlation was again done while splitting the data by type of school, the researcher found out that boys schools have no significant correlation with regard to number of computers and their number in school. The girls' schools on the other hand have significant correlation index of 0.67 at 0.01 level of significant as shown on the table below.

Table 4.0: The correlation between the number of students and the number of computers in good condition

Correlations

		Number of Students	Number of Good Computers
Number of Students	Pearson Correlation	1	.367**
	Sig. (2-tailed)		.004
	N	60	60
Number of Good Computers	Pearson Correlation	.367**	1
	Sig. (2-tailed)	.004	
	N	60	60
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Research Data

Table 5.0:The correlation between the number of students and the number of computers in good condition per school type

Correlations

School			Number of Students	Number of Good Computers
Boys	Number of Students	Pearson Correlation	1	.092
		Sig. (2-tailed)		.745
		N	15	15
	Number of Good Computers	Pearson Correlation	.092	1
		Sig. (2-tailed)	.745	
		N	15	15
Girls	Number of Students	Pearson Correlation	1	.670**
		Sig. (2-tailed)		.006
		N	15	15
	Number of Good Computers	Pearson Correlation	.670**	1
		Sig. (2-tailed)	.006	
		N	15	15
Mixed	Number of Students	Pearson Correlation	1	.424*
		Sig. (2-tailed)		.020
		N	30	30
	Number of Good Computers	Pearson Correlation	.424*	1
		Sig. (2-tailed)	.020	
		N	30	30
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

Source: Research Data

4.1.4 Internet Availability

The researcher also wanted to know whether there is internet in the schools. The research found out that only 45% of the school have internet while 55% of the school don't have internet in the school. The researcher was also keen to ask how reliable these internet connections are and the answer is in the section of challenges in this report where 37% responded that the connection is not reliable.

Table 6.0: Internet Availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	33	55.0	55.0	55.0
	Yes	27	45.0	45.0	100.0
	Total	60	100.0	100.0	

Source: Research Data

Figure 5: Internet Availability

Internet_Availability

No
Yes

45.00%

55.00%
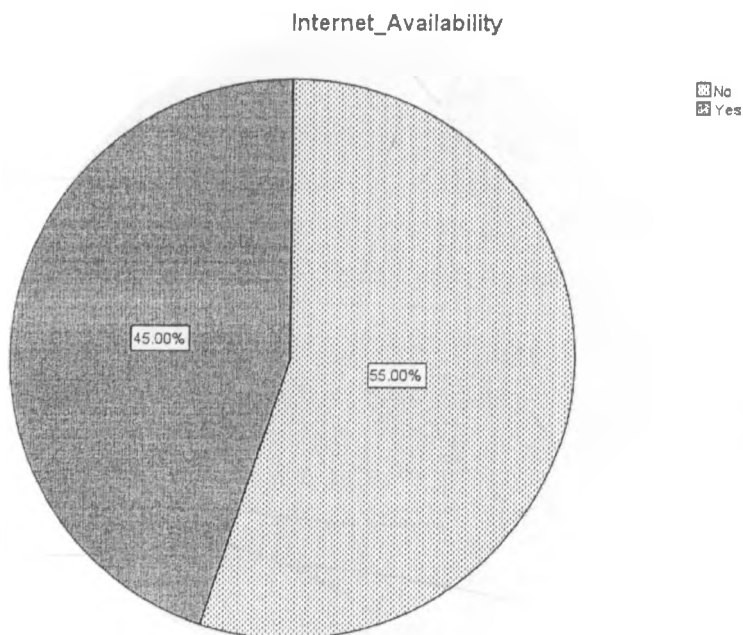
Source: Research Data

4.1.5 The Percentage Computer Lab In The School

The researcher wanted to know the number of computer labs in the schools and found out that 34 out of the 60 schools had at least room set aside for computer lessons, this constituted 56.7 % of the computer labs in the schools.

Table 7.0: The percentage of the schools with and without computer lab

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	26	43.3	43.3	43.3
	Yes	34	56.7	56.7	100.0
	Total	60	100.0	100.0	

Source: Research Data

Figure 6.0: The percentage of the schools with and without computer lab

ComputerLab_Yes_No

■ No
▓ Yes
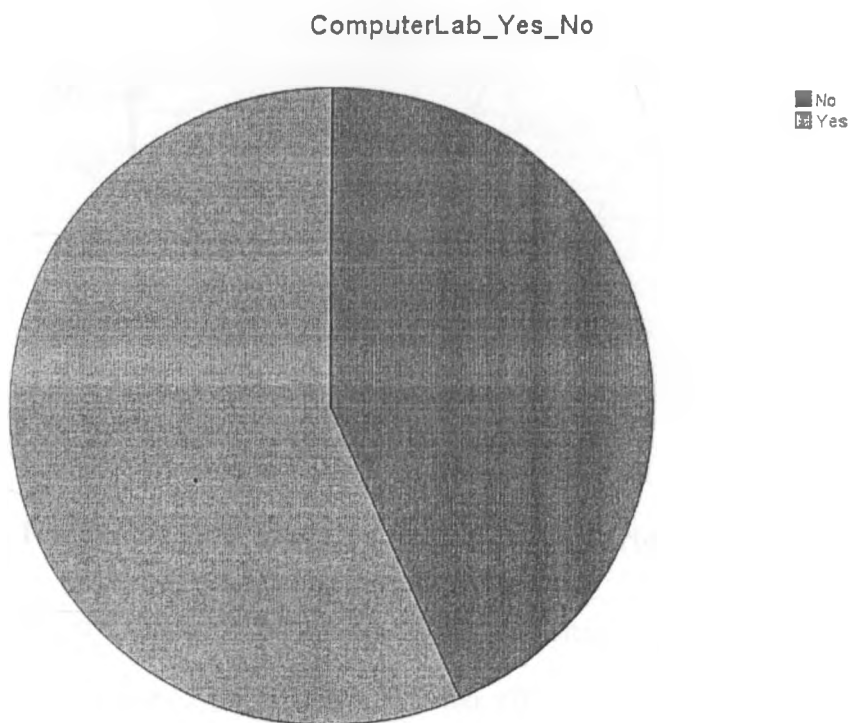
Source: Research Data

4.2 Extent Of E-Leaning Readiness In Public Secondary Schools In Kisumu County

4.2.1 Computer Availability To The Students At Various Times

The researcher wanted to knowthe availability of computers to students at the following times (Mon – Fri 8 a.m.–5 p.m., Mon – Fri after official lessons, Weekendsand Always). The researcher found out that Monday to Friday during normal working hour, the computer availability was the highest at 23.3 % while "availability always" it was lowest at 5.0%.

Table 8.0: Availability of computers to students at various times

MonToFri8am					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	46	76.7	76.7	76.7
	Yes	14	23.3	23.3	100.0
MonToFriday Afterlessons					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	53	88.3	88.3	88.3
	Yes	7	11.7	11.7	100.0
Weekends					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	56	93.3	93.3	93.3
	Yes	4	6.7	6.7	100.0
Always					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	57	95.0	95.0	95.0
	Yes	3	5.0	5.0	100.0

Source: Research Data

4.2.2 Internet Availability To Students At Various Times

The researcher wanted to know the availability of internet to students at the following times (Mon – Fri 8 a.m.–5 p.m., Mon – Fri after official lessons, Weekendsand Always) .The researcher found out that Monday to Friday during normal working hour, the internet availability was the highest at 15 % while "availability always" it was lowest at 0 %.

Table 9.0:Availability of internet to students at various times

MonToFrid8am

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	51	85.0	85.0	85.0
	Yes	9	15.0	15.0	100.0

MonToFriday Afterlessons

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	56	93.3	93.3	93.3
	Yes	4	6.7	6.7	100.0

Weekends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	57	95.0	95.0	95.0
	Yes	3	5.0	5.0	100.0
	Total	60	100.0	100.0	

Always

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	60	100.0	100.0	100.0

Source: Research Data

4.2.3 Students Collaboration With Others

The researcher wanted to know whether the students collaborate with others using computers in the schools on academic matters. Only 6.7% of the respondents confirmed that the students collaborate with others while 93.3% did not.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	56	93.3	93.3	93.3
	Yes	4	6.7	6.7	100.0
	Total	60	100.0	100.0	

Source: Research Data

Figure 7: Students collaboration with others

StudColYesNo

■ No
▨ Yes
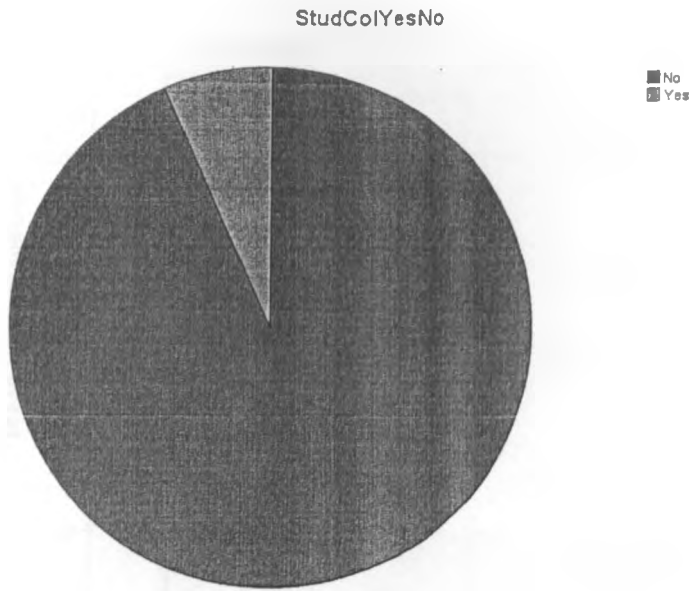
Source: Research Data

4.2.4 Main Purpose Of Internet In School

The researcher wanted to know what purpose mainly the schools use Internet, 50% of the response was "E-mail and basic communication", 10% of response was "internal use and other activities" while 30% was for teaching and learning. This is an indicator that most of the connectivity in various schools are not geared toward improvement of the learning in schoolsbut is majorlyfor other various activities in the schools.

Figure 8: Use of internet in a school
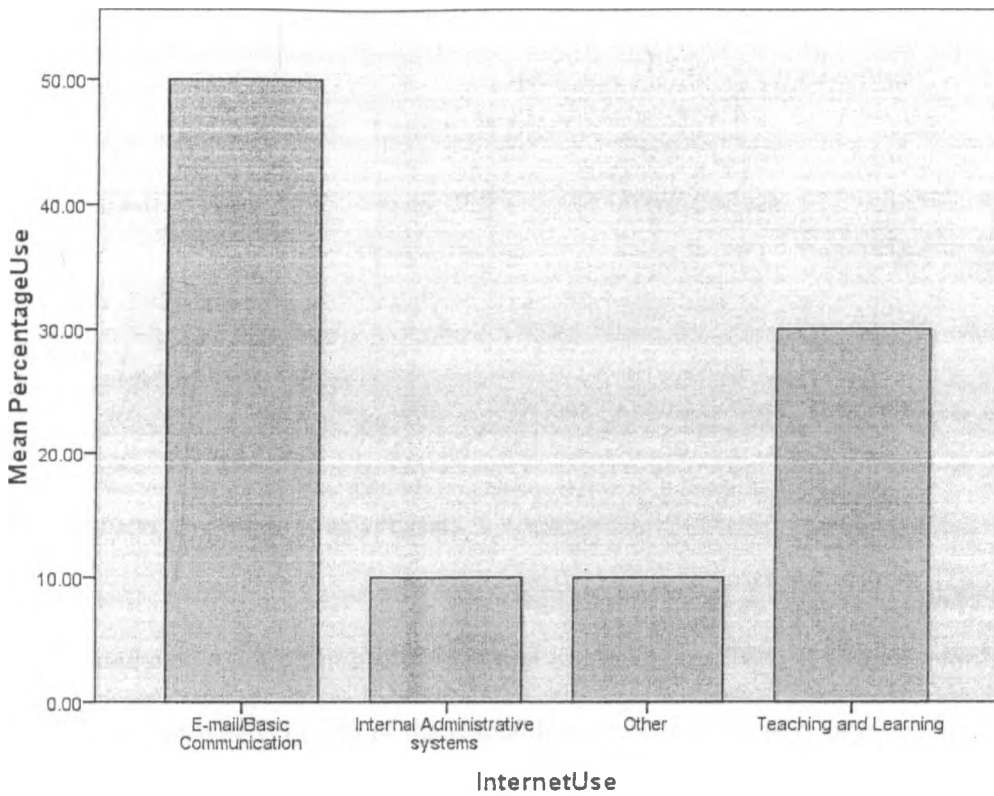
Source: Research Data

4.2.5 The extent of use of TV, Radio, CD player, Video Tape

The researcher also wanted to know to what extent the schools use various electronic teaching aids to teach in class. From the definition of e-learning we realized that it involves other devices other than the computer so the TV, Radio and other devices can very well indicate the direction of the e-learning in school. The researcher looked at these devices and got varying responses as can be seen in the table below. On average cd-player is frequently used compared to other devices in the school where 81.7% of the respondents use it to smaller extent and 1.7% use it to a bigger extent.

Table 10.0: The extent of use of TV, Radio, CD player, Video Tape

TV			Radio		CD Player Video		Video Tape	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
No extent at all	39	65.0	39	65.0	0		51	85.0
Very small extent	9	15.0	9	15.0	49	81.7	0	
Small extent	9	15.0	8	13.3	8	13.3	0	
Large Extent	2	3.3	2	3.3	2	3.3	8	13.3
Very large extent	1	1.7	2	3.3	1	1.7	1	1.7
Total	60	100.0	60	100.0	60	100.0	60	100.0

Source: Research Data

4.2.6 Computer use in various subjects

The researcher wanted to know subjects where computer is used to teach student or demonstrate appoint to students in the school, and the extent of use. As can be seen from the table below, computer studies lead in use where 11.7% of the respondent use computer to a large extent to teach the subject followed by other subjects like physics, mathematics, biology and chemistry, the use of computer in other subjects like Kiswahili and others were very little so the researcher decided to marge all of them together as other subjects.

Table 11.0:Computer use in various subjects

Computer Studies			Mathematics		Biology		Physics		Chemistry			Others	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%		Freq	%
No extent at all	23	38.3	20	33.3	21	35.0	14	23.3	29	48.3		37	61.7
Very small extent	10	16.7	17	28.3	21	35.0	15	25.0	17	28.3		14	23.3
Small extent	8	13.3	6	10.0	11	18.3	17	28.3	10	16.7		5	8.3
Large Extent	12	20.0	16	26.7	7	11.7	9	15.0	4	6.7		4	6.7
Very large extent	7	11.7	1	1.7	0	0	5	8.3	0	0		0	0
Total	60	100.0	60	100.0	60	100.0	60	100.0	60	100.0		60	100.0

Source: Research Data

4.3 E-learning readiness

4.3.1 How ready are the schools to roll out the e-learning program?

The researcher wanted to know how ready the schools are to fully roll out e-learning program. The found out that 33% of the respondents were not ready while 16% of the respondents were ready to small extend the remaining 7% were ready to roll out the program, 4% of the respondent appeared to be very confident enough.

Table 12.0:School E-learning readiness

E-learningReadiness		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	33	55.0	55.0	55.0
	Very small	16	26.7	26.7	100.0
	Ready	7	11.7	11.7	66.7
	Very Ready	4	6.7	6.7	73.3
	Total	60	100.0	100.0	

Source: Research Data

Figure 9: School E-learning readiness

ElearningReadiness

- Not at all
- Ready
- Very Ready
- Very small
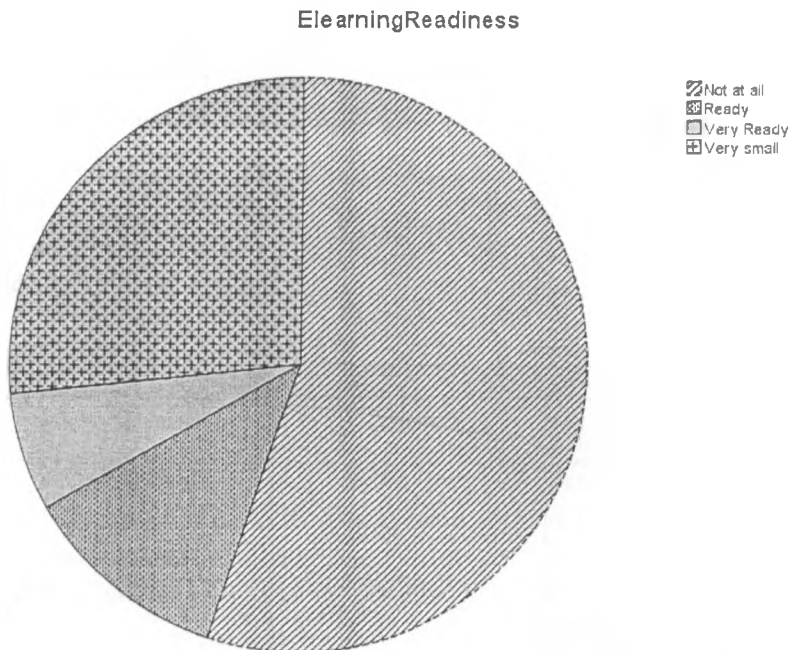
Source: Research Data

4.3   E-learning challenges

In this section the researcher will analyze the various challenges noted that hamper the e-learning adoption and readiness in the schools sampled.

4.4.1 Commercial power supply

The researcher wanted to know how available the commercial power supply is to the schools. The researcher found out that 86.7% of the schools that responded were supplied by the KPLC while others have generators and are in the process of acquiring the commercial power supply.

Table 13.0: Commercial power supply

Power Supply					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	8	13.3	13.3	13.3
	Yes	52	86.7	86.7	100.0
	Total	60	100.0	100.0	

Source: Research Data

4.4.2 Power outage

The researcher wanted to know how frequently the schools with commercial power supply experience power supply outages in a month.

Table 14.0: Power outage

PowerOutage[a]					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 times per Month	7	14.9	14.9	14.9
	More Than 3 times	32	68.1	68.1	83.0
	Once per Month	5	10.6	10.6	93.6
	Twice per Month	3	6.4	6.4	100.0
	Total	47	100.0	100.0	

a. PowerSupply = Yes

Source: Research Data

Figure 10: Power Outage

PowerOutage

PowerSupply: Yes

Legend:
- 3 times per Month
- More Than 3 times
- Once per Month
- Twice per Month

6.38%
10.64%
14.89%
68.09%
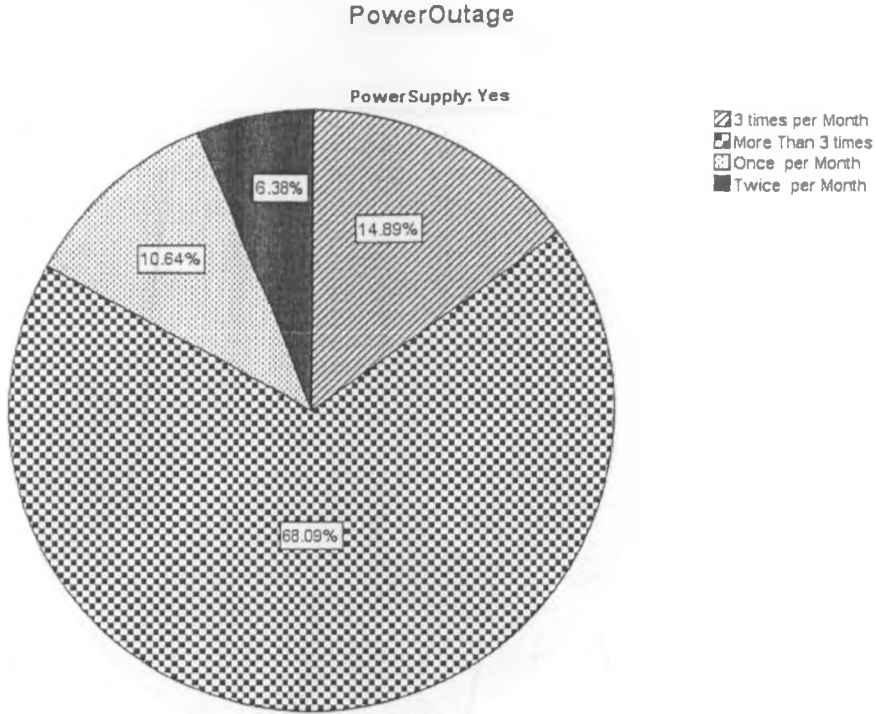
Source: Research Data

4.4.3 Internet Reliability

The researcher wanted to know how reliable the internet connection is among the schools that indicated internet availability the school.

Table 15.0: Internet Reliability

InternetReliability[a]

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	10	37.0	37.0	37.0
	Reliable	4	14.8	14.8	51.9
	To some extent	13	48.1	48.1	100.0
	Total	27	100.0	100.0	

a. Internet_Availability = Yes

42

Figure 11: Internet Reliability

InternetReliability

Internet_Availability: Yes

- Not at all
- Reliable
- To some extent
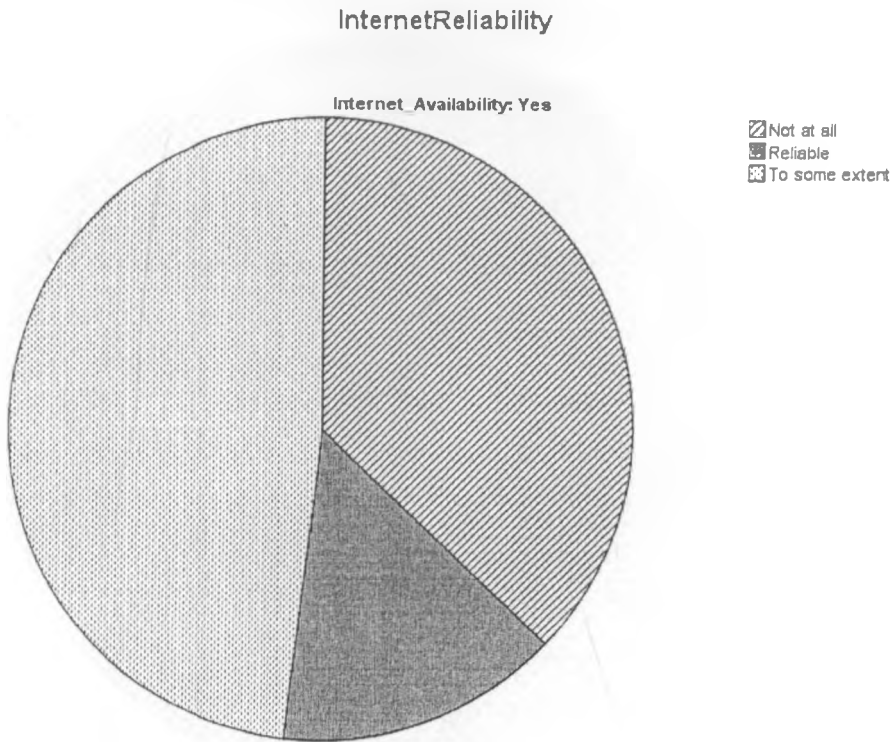
Source: Research Data

Table 16.0: E-learning Content Availability

E-learning Content

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Many times	7	11.7	11.7	11.7
	Not at all	27	45.0	45.0	56.7
	Some times	22	36.7	36.7	93.3
	Very Many	4	6.7	6.7	100.0
	Total	60	100.0	100.0	

Source: Research Data

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Figure 12: E-learning Content Availability

ElearningContent

Legend:
- Many times
- Not at all
- Some times
- Very Many

Pie chart values: 6.67%, 11.67%, 36.67%, 45.00%
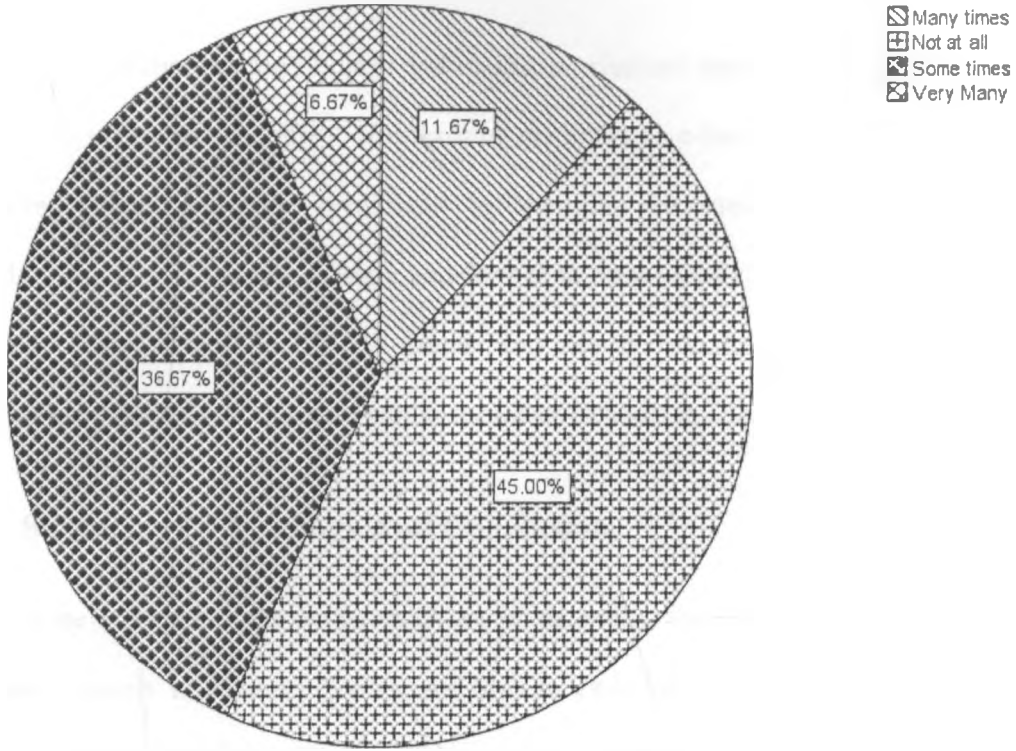
Source: Research Data

CHAPTER FIVE: SUMMARY, CONCLUSIONS ANDRECOMMENDATIONS

5.1 Introduction

This chapter summarizes the findings and makes conclusions based on the specific objectives of this study i.e. to investigate the effect of e-learning readiness on e-learning adoption in secondary schools in Kisumu County and more specifically to determine the extent of e-leaning readiness in public secondary schools in Kisumu County and further to established the extent of e-learning adoption in public secondary schools in Kisumu County and also to even determine the influence of e-learning readiness on e-learning adoption in public secondary schools in Kisumu County.

5.2   Summary Of Findings And Conclusion

Based on the objective of the study which was to determine the extent of e-leaning readiness in public secondary schools in Kisumu County and also to established the extent of e-learning adoption in public secondary schools in Kisumu County and to further determine the influence of e-learning readiness on e-learning adoption in public secondary schools in Kisumu County; The analysis indicates that the public secondary schools even though they have made a great stride towards being ready for the e-learning by laying down relevant infrastructure like electricity, computers availability, there is still need to overcome some challenges like power outage, internet availability, and even the e-learning content to successfully have a sustainable e-learning system. The situation as at now indicate that the public secondary school in Kisumu county are still not ready for e-learning and even the impact of e-learning adoption is still too low.

Computer availability to the students is also majorly during the class hour only, thismight not be enough for the students to fully achievethe necessary skills to seamlessly use computer to even collaborate with other students on academic matters. The few available computers are still under lock

and key and guarded by the administration in such a way that they cannot be used freely to achieve the e-learning goals.Internet availability to students is very low and only available during working hours, this indicate to the researcher that the students only access internet when they are in computer class which is really limiting especially when the school want to fully embrace e-learning environment.

E-learning readiness is still very low in public secondary schools and this is justified by the 55% of the respondents responding that they are still not ready at all to roll out the e-learning program. The lack of e-learning content also contributes heavily to the low readiness status of the public secondary school where 45% of the respondents are not able to get any relevant e-learning content material that they can use in class.

Based on the research findings, Girls schools tend to have more computers than the boys and days school in Kisumu County. Computer studies also lead other subjects in the use of e-learning content at 11.7% followedby physics at 8.3% then closely by mathematics at 1.7%. Other subjects like chemistry are also slowly starting the use of computer to teach or demonstrate a point in class.

5.3Recommendations

The schools need to further invest in the ICT infrastructure to increase the information awareness to both the teachers and even the students. This will increase the access of computers to students and even teachers which will in effect build on the e-learning adoption methods and even encourage the stakeholders to further invest in acquisition of e-learning content. Secondly, the computers availability especially during student's free time like weekends needs to be encouraged to increase the time the students take to interact with the computers, this will increase their creativity and easy adaptation to e-learning program. Thirdly, the schools also need very reliable power back-up system to help reduced the effect of power outage. Most of the schools experience frequent power outage as can be seen from the findings and this has a serious effect on e-learning program. By having power backup, they can

reduce this effect and even confidently schedule e-learning classes any time of the day without fear of power failure.

The schools also need to employ ICT personnel with the right skills to help them in both maintenance and even the search for the relevant e-learning materials online which will in effect increase their chances of successfully rolling out the e-learning program.

5.4Limitation of the study

This research was done at the peak of teachers strike in the country and this has significantly contributed to the low response by the respondents and even made it difficult to visit some schools during the time for data collection. The researcher also fears that most of the respondents did not give their best because of the same effect of the strike and this could impact to some extent the result of some findings.

The study purely targeted public secondary schools in Kisumu County whose characteristics could be significantly different from other school in other counties or even private schools in the same county, so generalization of the finding might not reflect the true situation in other counties or even in private schools.

5.5 Suggestions For Further Research

The researcher conducted a survey on e-learning readiness in public secondary school in Kisumu Countyand recommended that a study should be carried to determine the effect of e-learning readiness on the students' performance in National exam. A research should also be carried out to survey the e-learning challenges in our public universities. E-learning effect on the quality of learning in our public universities is also a very good area of study.

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1	39701001	KISUMU BOYS' HIGH SCHOOL – Boys Boarding
2	39701002	KISUMU GIRLS' HIGH SCHOOL – Girls Boarding
3	39701003	KISUMU DAY SECONDARY SCHOOL – Boys Boarding
4	39701004	MUSLIM SECONDARY SCHOOL – Mixed Boarding
5	39701005	LIONS HIGH SCHOOL – Mixed Boarding
6	39701007	ST TERESA'S GIRLS SECONDARY SCHOOL – Girls Boarding
7	39701008	KASAGAM SECONDARY SCHOOL – Mixed Boarding
8	39701009	XAVERIAN SEC SCHOOL – Mixed Boarding
9	39701010	JOYLAND SPECIAL SECONDARY SCHOOL – Mixed Boarding
10	39701011	JOEL OMINO MIXED SECONDARY SCHOOL – Mixed Boarding
11	39701013	OBWOLO MIXED SECONDARY SCHOOL – Mixed Boarding
12	39701014	DR. ALOO GUMBI SECONDARY SCHOOL – Mixed Boarding
13	39701015	NYAMASARIA SECONDARY SCHOOL – Mixed Boarding
14	39701016	MIWANI SECONDARY SCHOOL – Boys Boarding
15	39701018	OKOK MIXED SECONDARY SCHOOL – Mixed Boarding
16	39701022	ST ALLOYS MAYENYA SECONDARY SCHOOL – Mixed Boarding
17	39701026	ST ALBERT ANGIRA SECONDARY SCHOOL – Boys Boarding
18	39701027	ST IGNATIUS LOYOLA SEC SC HOOL-MAGADI – Mixed Boarding
19	39701028	ST PETERS NANGA MIXED SECONDARY SCHOOL – Mixed Boarding
20	39701029	NYALUNYA MIXED SECONDARY SCHOOL – Mixed Boarding
21	39701030	ST. PETER'S KINDU SECONDARY SCHOOL – Mixed Boarding
22	39701031	ORONGO MIXED SECONDARY SCHOOL – Mixed Boarding
23	39701034	BISHOP ABIERO SHAURIMOYO SECONDARY SCHOOL – Mixed Boarding
24	39701035	G P OWITI CHIGA MIXED SECONDARY SCHOOL – Mixed Boarding
25	39701101	OTIENO OYOO SECONDARY SCHOOL – Boys Boarding
26	39701102	WITHUR BOYS SECONDARY SCHOOL – Mixed Boarding
27	39701103	MIGINGO GIRLS SECONDARY SCHOOL – Girls Boarding
28	39701104	MASOGO MIXED SECONDARY SCHOOL – Mixed Boarding
29	39701105	NDURU MIXED SECONDARY SCHOOL – Mixed Boarding
30	39701106	LELA SECONDARY SCHOOL – Mixed Boarding
31	39701107	ALENDU SECONDARY SCHOOL – Mixed Boarding
32	39701108	AROMBO MIXED SECONDARY SCHOOL – Mixed Boarding
33	39701110	NYAKAKANA MIXED SECONDARY SCHOOL – Mixed Boarding
34	39701111	ONG'ECHE MIXED SECONDARY SCHOOL – Mixed Boarding
35	39701112	KOBURA GIRLS' SECONDARY SCHOOL – Girls Boarding
36	39701113	KANYAGWAL MIXED SECONDARY SCHOOL – Mixed Boarding
37	39713001	AHERO GIRLS SECONDARY SCHOOL – Girls Boarding
38	39713002	AWASI MIXED SECONDARY SCHOOL – Mixed Day & Boarding
39	39713003	ST CHRISTOPHER AYWEYO R. C. MIXED – Mixed Day
40	39713004	BUNDE MIXED SECONDARY SCHOOL – Mixed Day
41	39713005	ST. CAMULUS OGWEDHI MIXED SEC SCH – Mixed Day
42	39713006	ONJIKO HIGH SCHOOL – Boys Boarding
43	39713007	KATOLO MIXED SECONDARY SCHOOL – Mixed Day
44	39713009	KOCHOGO HIGH SCHOOL – Mixed Day
45	39713010	ST.ALEX AYUCHA SECONDARY SCHOOL – Mixed Day
46	39713011	OREN MIXED SECONDARY SCHOOL – Mixed Day
47	39713012	ST. PETER'S KONIM MIXED SECONDARY SCHOOL – Mixed Day
48	39713013	OKANJA MIXED SECONDARY SCHOOL – Mixed Day
49	39713014	PALA MIXED SECONDARY SCHOOL – Mixed Day
50	39713015	ST MICHAELS WANG'ANG'A SEC SCHOOL – Mixed Day
51	39714001	SINYOLO GIRLS SECONDARY SCHOOL – Girls Boarding
52	39714002	CHULAIMBO SECONDARY SCHOOL – Boys Boarding
53	39714003	BISHOP OKOTH MIRANGA SEC SCHOOL – Mixed Day
54	39714005	ORANDO MIXED SECONDARY SCHOOL – Mixed Day
55	39714006	HUMA GIRLS SECONDARY SCHOOL – Girls Boarding
56	39714007	LWALA KADAWA MIXED SECONDARY SCHOOL – Mixed Day
57	39714008	MARIWA MIXED SECONDARY SCHOOL – Mixed Day
78	39714112	OMUYA MIXED SECONDARY SCHOOL – Mixed Day
79	39714113	RIDORE ACK MIXED SECONDARY SCHOOL – Mixed Day
80	39733101	CHERWA MIXED SEC SCH – Mixed Boarding
81	39733102	KANDARIA MIXED SECONDARY SCHOOL – Mixed Boarding
82	39733103	LISANA SECONDARY SCHOOL – Mixed Boarding
83	39733104	MAGUNGA SECONDARY SCHOOL – Mixed Boarding
84	39733105	MORO MIXED SECONDARY SCHOOL – Mixed Boarding
85	39733106	NYABOLA MIXED SECONDARY SCHOOL – Mixed Boarding
86	39733107	OLEMBO BOYS SECONDARY SCHOOL – Boys Boarding
87	39733108	RAE GIRLS SECONDARY SCHOOL – Girls Boarding
88	39733109	RAGEN A.I.C MIXED SECONDARY SCHOOL – Mixed Boarding
89	39733110	ST ALOYS GEM SECONDARY SCHOOL – Mixed Boarding
90	39733111	ST CHARLES LWANGA NDORI SECONDARY SCOOL – Mixed Boarding
91	39733112	THURGEM SECONDARY SCHOOL – Mixed Boarding
92	39733113	URUDI MIXED SECONDARY SCHOOL – Mixed Boarding
93	39733201	AGAI MIXED SECONDARY SCHOOL – Mixed Boarding
94	39733202	BISHOP N K NGALA MIXED SECONDARY SCHOOL – Mixed Boarding
95	39733203	BISHOP OKUMU SECONDARY SCHOOL – Mixed Boarding
96	39733204	BODI MIXED SECONDARY SCHOOL – Mixed Boarding
97	39733205	DIRUBI SEC SCHOOL – Mixed Boarding
98	39733206	GUU MIXED TECHNICAL SECONDARY SCHOOL – Mixed Boarding
99	39733207	HOLO MIXED SECONDARY SCHOOL – Mixed Boarding
100	39733208	KABONDO BOYS SECONDARY – Boys Boarding
101	39733209	MIRIU MIXED SECONDARY SCHOOL – Mixed Boarding
102	39733210	NAKI SECONDARY SCHOOL – Mixed Boarding
103	39733212	NYABONDO HIGH SCHOOL – Boys Boarding
104	39733213	NYAKACH GIRLS' HIGH SCHOOL – Girls Boarding
105	39733214	RAKWARO MIXED SECONDARY SCHOOL – Mixed Boarding
106	39733215	SIANY MIXED SECONDARY SCHOOL – Mixed Boarding
107	39733216	SIGOTI COMPLEX GIRLS SECONDARY SCHOOL – Girls Boarding
108	39733217	ST. ANTONY'S SECONDARY SCHOOL – KAJIMBO – Mixed Boarding
109	39733218	ST. HILARIUS SECONDARY SCHOOL – Mixed Boarding
110	39733219	ST MARY NYAMARIMBA GIRLS SECONDARY SCHOOL – Girls Boarding
111	39733301	ABWAO MIXED SECONDARY SCHOOL – Mixed Boarding
112	39733302	ANDING'O OPANGA SEC. SCHOOL – Mixed Boarding
113	39733303	MBUGRA MIXED SECONDARY SCHOOL – Mixed Boarding
114	39733304	NYONG'ONG'A SECONDARY SCHOOL – Mixed Boarding
115	39733305	SANG'ORO SECONDARY SCHOOL – Mixed Boarding
116	39733306	SANGO BURU MIXED SECONDARY SCHOOL – Mixed Boarding
117	39733307	THURDIBUORO MIXED SECONDARY SCHOOL – Mixed Boarding
118	39733308	OUR LADY OF LOURDES BOLO GIRLS SECONDARY SCHOOL – Girls Boarding
119	39734301	NGERE KAGORO SEC SCH – Mixed Day
120	39734302	NYAKOKO MIXED DAY SECONDARY SCHOOL – Mixed Day & Boarding
121	39734303	OMBEYI SECONDARY SCHOOL – Mixed Day
122	39734304	ST.BENEDICT'S NYANGOMA – Mixed Day
123	39734305	ST BONIFACE MAGARE SECONDARY SCHOOL – Mixed Day
124	39734306	MASARA MIXED SECONDARY SCHOOL – Mixed Day
125	39734307	PROF. AYIECHO OBUMBA – Mixed Day
126	39734308	NGENY MIXED SECONDARY SCHOOL – Mixed Day
127	39734309	OLIK OLIERO MIXED SECONDARY – Mixed Day
128	39734401	ACHEGO GIRLS SECONDARY SCHOOL – Girls Boarding
129	39734402	KORU GIRLS SEC SCH – Girls Boarding
130	39734403	MUHORONI MIXED SECONDARY – Mixed Day & Boarding
131	39734404	SONGHOR SECONDARY SCHOOL – Mixed Day & Boarding
132	39734406	ST. AUGUSTINE'S KADENGE SECONDARY SCHOOL – Mixed Day & Boarding
133	39734407	ST. PATRICKS' ODUWO SECONDARY SCHOOL – Mixed Day

58	39714009	RATTA MIXED SECONDARY SCHOOL – Mixed Day
59	39714010	SIANDA MIXED SECONDARY SCHOOL – Mixed Day
60	39714011	KUOYO MIXED SECONDARY SCHOOL – Mixed Day
61	39714012	ST MARY'S GORETTY OLUOWA SECONDARY SCHOOL – Mixed Day
62	39714013	KITMIKAYI MIXED SECONDARY SCHOOL – Mixed Day
63	39714014	ST.PETER'S KAJULU SECONDARY SCHOOL – Mixed Day
64	39714015	KAWINO MIXED SECONDARY SCHOOL – Mixed Day
65	39714016	BISHOP ABIERO GIRLS MAGWAR – Girls Day
66	39714017	ULALO SECONDARY SCHOOL – Mixed Day
67	39714101	NGERE HIGH SCHOOL – Boys Boarding
68	39714102	NDIRU MIXED SECONDARY SCHOOL – Mixed Day & Boarding
69	39714103	ALWALA MIXED SECONDARY SCHOOL – Mixed Day & Boarding
70	39714104	BONDE MIXED SECONDARY SCHOOL SEC SCH – Mixed Day
71	39714105	ALUNGO MIXED SECONDARY SCHOOL SEC SCH – Mixed Day
72	39714106	ST BARNABAS GIRLS' SECONDARY SCHOOL – Girls Boarding
73	39714107	DIEMO MIXED SECONDARY SCHOOL – Mixed Day
74	39714108	RAPOGI SECONDARY SCHOOL – Mixed Day
75	39714109	MAYIEKA MIXED SECONDARY SCHOOL – Mixed Day
76	39714110	KADERO SUNRISE SECONDARY – Mixed Day
77	39714111	ST ALOYS RERU GIRLS SECONDARY SCHOOL – Girls Boarding

134	39734408	ST. STEPHEN'S MENARA SECONDARY SCHOOL – Mixed Day & Boarding
135	39734409	MARIWA SEC SCHOOL – Mixed Day
136	39734411	GOD ABUORO SECONDARY SCHOOL – Mixed Day
137	39734412	OGINGA ODINGA TAMU SECONDARY SCHOOL – Mixed Day
138	39734413	KIBIGORI MIXED SEC SCH – Mixed Day
139	39734414	OUR LADY OF PEACE MUHORONI SECONDARY SCHOOL – Mixed Day
140	39734415	MWAI ABIERO OGEN SECONDARY – Mixed Day
141	39737001	OGADA MIXED SECONDARY SCHOOL – Mixed Boarding
142	39737002	BISHOP OKOTH OJOLLA GIRLS SECONDARY SCHOOL – Girls Boarding
143	39737003	TIENG'RE MIXED SECONDARY SCHOOL – Mixed Boarding
144	39737004	BAR UNION SECONDARY SCHOOL – Mixed Boarding
145	39737005	DAGO-KOKORE SECONDARY SCHOOL – Mixed Boarding
146	39737006	ONGALO MIXED SECONDARY SCHOOL – Mixed Boarding
147	39737007	DAGO THIM SECONDARY SCHOOL – Mixed Boarding
148	39737008	OBEDE SECONDARY SCHOOL – Mixed Boarding
149	39737009	OBAMBO SECONDARY SCHOOL – Mixed Boarding
150	39737010	WACHARA MIXED SECONDARY SCHOOL – Mixed Boarding
151	39737011	KIREMBE – Mixed Boarding
152	39737012	OSIRI MIXED SECONDARY SCHOOL – Mixed Boarding
153	39737014	KANYAMEDHA MIXED SECONDARY SCHOOL – Mixed Boarding

APPENDIX II SURVEY QUESTIONNAIRE

Instructions

This questionnaire will take at most 15 minutes of your time to fill.

Please read the instructions provided for each question. A number of questions only require you to indicate your response(s) by marking a tick in the boxes provided. In cases where you are required to write down your response(s) or comments, write them in the spaces immediately after the questions. Be brief and precise.

SECTION A: GENERAL INFORMATION

1. Name of School:_____

2. What is your gender?

   [ ] Male   [ ] Female

3. How many students does the school have?

4. Does the school have internet connection?

   [ ] Yes   [ ] No

5. If yes, for what purpose mainly does your school use Internet

E-mail/Basic Communication	
Teaching and Learning	
Internal Administrative systems	
All of the above	
Other	

6. What is the total number of printers in the school?

7. How many ICT personnel/teacher does the school have?

8. Do you have a computer lab

   [ ] Yes   [ ] No

9. If yes, how many computers are in good condition?

10. If yes, how many students share one computer in laboratory lessons or class group work?

SECTION B

Extent of e-learning adoption in public secondary schools in Kisumu County

11. Are computers available to students at the following times?

a. Mon – Fri 8 a.m.–5 p.m.

b. Mon – Fri after official lessons

c. Weekends

d. Always

Yes	No
Yes	No
Yes	No
Yes	No

12. Is internet available to students at the following times?

a. Mon – Fri 8 a.m.–5 p.m.

b. Mon – Fri after official lessons

c. Weekends

d. Always

Yes	No
Yes	No
Yes	No
Yes	No

13. Do students collaborate with other students from other schools using computers in the schools on academic matters?

[ ]Yes   [ ] No

14. To what extent do you use the following to learn?

(1=Not at all...........................5= To greater extent)

	Not at all				To greater Extent
	1	2	3	4	5
Internet					
TV					
Radio					
CD Player/Video					
Videotape					

15. Please indicate subjects where computer is used to teach student or demonstrate appoint to students in the school, and indicate the extent of use?

16. (1=Not at all...........................5= To greater extent)

	Not at all				To greater Extent
Subjects	1	2	3	4	5

SECTION C:

E-Learning Readiness

17. Given the computer resources, electricity and e-learning content that you have, do you consider yourself ready to roll out the e-learning program fully in your school?

[ ] Not at all   [ ] Very small extent [ ] Ready   [ ] Very Ready

SECTION D:

Challenges of e-leaning

18. Does your school have access to commercial power supply from the electrical utility company (i.e., KPLC)?

[ ] Yes   [ ] No

19. How frequently do you experience commercial electrical supply outages in a month?

[ ] Never   [   ] Once   [ ] twice [   ] 3 times[   ] More than 3 times

20. How reliable is your internet connection?

[ ] Very reliable   [   ]To some extent [   ]Not reliable

21. How often do you get relevant e-learning content that help in syllabus coverage?

[ ] Many times [   ] Sometimes   [ ] Not at all

Thank you for taking the time to fill in this questionnaire