



UNIVERSITY OF NAIROBI

COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES

SCHOOL OF COMPUTING AND INFORMATICS

RESEARCH REPORT

The effect of digital content utilization on teaching and learning in Kenyan secondary schools

Presented to: Dr. R Oboko

BY

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REG NO: P56/60420/ 2011

A Research report submitted in partial fulfillment of the MSC (IS) Research project

Declaration

I declare that this project is my original work done without infringements on any intellectual copies whatsoever for the partially fulfillment of Msc (IS).

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Dedication

Dedicated to my family for standing by me; enduring my absence in my pursuit for knowledge, friends who supported me in all ways.

Acknowledgment

To all the good people who made my project a success. Family members who endured my absence physically and mentally, friends who supported me with advice and most gratitude to my supervisor Dr. Robert Oboko for making this project a success.

List abbreviations

ADK	Asian Development Bank
CDF	Community Development Funds
EFA	Education for All
ESP	Economic Stimulus Package
FDSE	Free Day Secondary Education
GESCI	Global e-Schools and Communities Initiative
GIZ	Gessellschaft fŮr Internationale Zusammenarbeit
HTML	Hypertext Markup Language
ICT	Information and Communication Technology
KESSP	Kenya Education Sector Support Program
KIE	Kenya Institute of Education
MOE	Ministry of Education
NGOs	Non Governmental Organization
PPP	Public Private Partnership
UNESCO	United Nations Education, Social and Cultural Organizations
UNICEF	United Nations Children's Fund
UON	University of Nairobi

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Abstract

E-learning is becoming a practical solution to the major constraint on teacher student ratio in Kenyan secondary schools. Digital content utilization has been adopted over time to serve as an educational resource in and out of the classroom. The purpose of the study was to assess the effect of digital content utilization in teaching and learning in Kenyan secondary schools that have embraced e-learning. Two objectives were formulated to guide in the study: to *investigate the level¹¹ of digital content utilization* in Kenyan secondary schools and to find out how digital content *utilization* has impacted teaching and learning in Kenyan secondary schools. The research adopted a cross sectional survey method in investigating the different ways in which digital content has impacted on pedagogy in Kenyan secondary schools. The study focused on teachers and students who form the nerve centre of teaching and learning process. Stratified random sampling technique was used to derive a representative sample. The sample comprised 80 students and 80 teachers representing 30% of the target population of ICT endowed secondary schools in the study counties. The collected data was analyzed using frequency distribution tables and percentages. The findings revealed some positives and negative impacts on teaching and learning accruing from use of digital content. Learner participation, motivation, stimulating content, self- directed discovery and enhanced understanding of concept come out as the positive effects while inadequate content, shallow coverage of concepts and lack of infrastructure were the negatives.

From the research training of both teachers and students is recommended to capacitate them in utilization of available open resources for building custom digital learning resources to fill in the huge need.

Key words:

Learner participation, Stimulated learning, Learner motivation, Self directed discover

¹ The level refers to the areas in which content is used in pedagogy e.g. reference, course work, self learning and as a teaching aid.

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1.0 INTRODUCTION

The Ministry of Education (MOE) developed the Kenya Education Sector Support Program (KESSP) framework in 2005 that featured ICT as one of the priority areas with the aim of mainstreaming ICTs into the teaching and learning process (Farrell, 2007). Since the 1980s integration of ICTs in education has been compulsory in the developed nations (MOE, 2006). This is not so in developing nations such as Kenya, where ICT integration in education is considerably more recent, small-scale and experimental (MOE, 2006). The disparities in the teaching and learning resources in Kenyan schools are quite evident in the various schools around the country. Some schools are using traditional methods of pedagogy such as text book teaching, rote learning, chalk board instructional method and lecture method among others while some are well endowed in terms of teaching and learning resources. Does endowment relate to utility? Most of these latter schools have incorporated contemporary information and communication technologies in pedagogy such as web based teaching platforms (Learning management systems), Instructional Digital Versatile Disks, audio tapes, smart boards, real time TV and radio broadcasts.

Performance at the high school level is a high stakes parameter that affects hundreds of thousands of young student's chances of securing careers in the tertiary educational institutions. This performance defines not only determines who proceeds to the next level of education but also prepares the students for specific career placement and hence a better opportunity in productivity thereafter. Several concerns have been raised on academic performance disparities between different schools leading to the emergence of a school of thought that raises the issue of ICT's equipped schools having an edge over the other schools that use traditional methods of pedagogy. Mwei, Too & Wando (2011) observed that the use of ICTs in learning enhances the student's cooperative skills and boost performance better than individually or those in control groups. Ogutu (2010) noted that the realization of ICT benefits in education is curtailed by various factors; among them lack of suitable e-content for various subjects. This challenge has been overcome to some extent through accelerated development of local digital content. MOE has listed slow integration of ICT in operations and programmes as one of

their major weakness (2008-2012 strategic plans). The MOE has also identified the opportunities that lie in integration of information and communication technology in teaching and learning.

In Kenya the communities have focused more on expansion of schools in the form of building new classrooms and new schools to accommodate the expanding numbers of students realized from the free primary education (FPE) programme (Farrell, 2007). This has been done at the expense of quality in the existing schools where getting a place in the school is a priority target for the parents. In as much as communities through the assistance of the Community Development Funds (CDF) are trying to expand the number of schools this may not meet the huge and ever increasing demand. The teacher to student ratio is wanting and the number of students who are unreachable is very high. This is an impediment for the universal goal of Education for All (EFA).

1.1 Theoretical framework:

The Dakar Framework for Action (World Education Forum, 2000) also stressed the use of ICT for achieving 'Education For All' (EFA) goals and recommended, "ICT must be harnessed to support EFA goals at an affordable cost (Hossain, Mahbub, 2012). It is for this reason that the need to develop digital content; empower schools for e-learning and encourage the use of e-learning facilities in Kenyan schools has made the Government and nongovernmental organizations invest in e-learning resources. The benefits of ICTs in education are varied as Kiptalam and Rodrigues (2009) correctly argued that the use of ICT in education has the potential to enhance the quality of teaching and learning. They further reiterated the benefit of ICT in improving the research productivity of teachers and students, and the management and overall effectiveness of institutions.

In another study; Law (2007) perceived that in designing effective learning experiences supported by technology, it is important not only to choose the appropriate technological tool, but also to have a clear understanding of the roles played by the teacher, the learner and the technology. These theories that support integration of multimedia components in pedagogy are the basis on which e-learning is built on. They also make a significant part of the research in bringing e-learning into the classroom.

1.2 Problem Statement

Digital platforms have permeated our lives and literally taken over all facets of our lives. The students are more attracted to MP3 files, elaborate videos and well designed graphics that are being used all around us. The use of electronic resources to provide instructions and teaching aids in learning and training institutions cannot be ignored in this era of digital globalization. E- Learning is also versatile and dynamic making it a very necessary avenue for overcoming the challenges facing the Kenyan high school student. The MOE has been rolling out digital content through the Kenya Institute of Education (KIE) with the first batch targeting five schools per constituency in the financial year 2011-2012. The second phase of the ESP is ongoing with a target of one school per constituency (MOE, 2012). Most schools took the initiative and acquired the digital content earlier from self supported plans. This research will also focus on analyzing how the overall performance for both the teacher and the student has been affected by these new methods of pedagogy. “In the past, emphasis was placed on print curriculum support materials, but with the advancement in information technology it has become necessary for KIE to develop electronic learning materials. (Nzomo, 2012). With all these efforts to digitize the educational resources there is still a grey area which requires research to shape policy focused on the digital teaching and learning resources available ,the level of accessibility to these resources and how they are utilized . The government plans are being supplemented by private enterprises such as Cyber School and nongovernmental organizations (NGOs) such as Gessellschaft für Internationale Zusammenarbeit (GIZ).

1.3 Goal of the study

The research intended to establish the impact of digital content utilization on teaching and learning in Kenyan secondary schools that have embraced e-learning through the ESP programme and self initiatives. The research also included the benefits accrued from access of these resources and some challenges faced and possible solutions.

1.4 Objectives of the study

The objective of this study was to:

1. Investigate the *level¹ of digital content utilization* in Kenyan secondary schools.
2. Find out how digital content *utilization* has affected teaching and learning in Kenyan secondary schools.

1.5 Rationale and Significance of the Study

The ongoing focus on digitization of curriculum and the economic stimulus package (ESP) programme supporting ICT infrastructure are public investments that are targeted at increasing uptake of digital content. Most ICT in education research work is based on challenges of ICT uptake in education (Andersson & Grönlund, 2009, p4), advantages of ICT integration in education (Marcelino, 2005, p27) and the benefits of ICT integration against other intervention parameters such as small classes, long teaching hours and teacher motivation (Hennessey, Onguko, Harrison, Ang'ondi, Namalefe, Naseem, & Wamakote, 2011).

Kiptalam and Rodrigues (2009) perceived their research to be a starting point for investigating the impact of the ICTs usage and utilization in secondary schools among African countries. They reiterated the need for further research to obtain more concise information on the usage and utilization of the ICTs. In their study, Mildred, Odera and Agak (2010), recommended that every school that has an ICT programme should seek to be connected to the internet and to be in possession of e-content relevant to the curriculum taught. They reiterated that this would facilitate teachers' roles that are required in learning and a teaching aid. Student centered learning e.g. use of e-learning in content delivery would be easy while learners would have more sources from which to carry out education research. The dissemination of e-content is ongoing and the ICT4E department of MOE is rolling out

support programmes through KESSEP. The missing link is the impact of digital content utilization both in classroom use and out of class use in the teaching and learning process.

1.6 Research questions

In order to achieve the objectives of the study the following questions were addressed.

Main Questions

1. What benefits has the student/teacher derived from utilizing digital content?
2. How is content utilized in secondary schools?
3. How is digital content access in the secondary schools?

Subsidiary Questions

1. What impedes access to available digital content?
2. What factors influence utilization and access of e-content within the schools?

1.7 Definitions of key Terms.

- *ICT* is an overall name used to describe all the computer and communication hardware and software used to enhance learning and manage educational programmes in organizations and educational institutions.
- *E-learning* is a broad set of applications and processes which involve use of web-based learning, computer-based learning and virtual classrooms. Much of the learning is delivered via the e-learning resources such as the internet, intranet, audio and video-tape, interactive TV, and satellite broadcast. The delivery of a learning, training or education program by electronic means. E-learning involves the use of a computer or electronic device (e.g. a mobile phone) in some way to provide training, educational or learning material (Stockley, 2003).

2.0 LITERATURE REVIEW

2.1 Introduction

The focus of this study will be in the utilization of digital content in various ways by different schools i.e. revision, reference or course material and how these has affected overall performance. The number of secondary schools has increased from a total of 6,566 secondary schools in 2008 to 7,308 in 2009(MOE, 2012).The ongoing free primary education (FPE) is straining the limited resources at the secondary school level. Integration of ICTs in the teaching and learning process has been identified as one of the avenues through which students can receive multi sensory learning sessions by interacting with digital content. ICT integration in other subjects will take the focus on ICT as a tool for computer studies and computer literacy skills to a method of learning and imparting 21st century skills to learners. Although the former are important skill sets, they are not sufficient in leveraging the true potential of ICTs to improve creativity, innovation and collaboration – key capacities in the new knowledge economy (Omondi, 2009).

The Institute for Perspective and Technological Studies (IPTS); reiterated in a comprehensive report (IPTS, 2006) on the impact of ICTs in education that;

It is difficult and maybe even impossible to imagine future learning environments that are not supported, in one way or another, by Information and Communication Technologies (ICT). When looking at the current widespread diffusion and use of ICT in modern societies, especially by the young – the so-called digital natives – then it should be clear that ICT will affect the complete learning process today and in the future (IPTS, 2006)

In line with these kind of realities the MOE in collaboration with other partners such as Safaricom, UNICEF, Intel and Kenya Institute of Education have embarked on rolling out an e-learning programme through support on building the infrastructure, capacity building the stakeholders and developing digital curriculum support materials for Kenyan schools, to enable the teaching and learning activities be carried out using technology. The government is adopting an integrated approach to

education where digital content seeks to compensate quality gaps in primary education (UNESCO, 2011).

2.2 Digital content utilization

2.2 .1 Ongoing e-learning projects

The Ministry has invested a lot of resources in order to realize full integration of ICTs in the curriculum. From around the year 2006, the government of Kenya has committed substantial amounts of resources to build Information Communication Technologies (ICTs) around the country and in the education sector in particular, with the sole purpose of catalyzing education as Tuwei, (1998) emphasized. This programme was initiated in the financial year 2005/2006. “In 2005/2006 and 2006/2007 of the financial years, MOE disbursed Sh319.5 million to 213 identified secondary schools in all the old 71 districts. Each beneficiary school received Sh1.5 million to purchase ICT facilities for e-learning,” (MOE, 2011). This investment has been matched with further funding in the year 2011/2012 where five schools in every constituency are receiving funds to buy 11 computers , 11 UPS , one printer, one LCD Projector and a complete local area network (LAN)set up as way of opening up the secondary schools to e-learning under the economic stimulus package (ESP) 2011. This was scaled up by including 420 more schools in the second phase beginning March 2012. To complement these efforts KIE is on course to develop and disseminate localized digital content for both secondary and primary schools in Kenya incorporating use of ICT in problem solving, critical thinking and collaborative learning. This digital content is available in twelve subjects targeting the secondary school curriculum and classes four to seven pupils. Further digital content development targeting ECD and the tertiary level is at an advanced level. Fullan (1992) identified three dimensions of change for the teacher using computers in the classroom:

- (1) The use of new hardware and software materials;
- (2) The adoption of new activities, behaviors or practices; and
- (3) Changes in beliefs and understanding.

He emphasized that we need to think through the change process and address the key factors associated with the implementation of computers in classrooms, such as characteristics of the innovation, commitment and support, professional development, and leadership of the principal. All these were key factors in this research in gauging the involvement of all the change agents in ICT integration in pedagogy.

2.2.2 ICT for education implementation strategies

One important strategy in the promotion and development of specific e-learning resources that would address the educational needs of primary, secondary and tertiary institutions is digitization of the curriculum which is ongoing at the KIE. Under the subtitle ‘E-learning’, the ICT policy goes on to outline the strategies that will be used in the promotion and development of ICT in teaching and learning. Other strategies outlined in The National Information & Communications Technology Strategy for Education and Training (MOE, 2006, p5-11) include:

- Promote the development of e-learning resources;
- Facilitate public-private partnerships to mobilize resources in order to support e-learning initiatives;
- Promote the development of an integrated e-learning curriculum to support ICT in education;
- Promote distance education and virtual institutions, particularly in higher education and training;
- Promote the establishment of a national ICT centre of excellence;
- Provide affordable infrastructure to facilitate dissemination of knowledge and skills through e-learning platforms;
- Promote the development of content to address the educational needs of primary, secondary, and tertiary institutions;
- Create awareness of the opportunities offered by ICT as an educational tool to the education sector;

- Facilitate sharing of e-learning resources between institutions;
- Exploit e-learning opportunities to offer Kenyan education programmes for export
- Integrate e-learning resources with other existing resource.

2.2.3 Projected ICT in education investments

The current plan on ICT integration in curriculum as outlined in the task force report (MOE, 2012, p227-228) projects that incorporation of ICT in the teaching environment is expected to:

- (a) Improve quality
- (b) Lead to improved teacher skills
- (c) Adapt teaching to the diversity of students
- (d) Improve how the school works and is managed
- (e) Provide feedback on students in real time
- (f) Improve the attentiveness and interest of students
- (g) Lead to a continuum of learning in the classroom and at home
- (h) Improve communication between all the partners (teachers, students and parents)
- (i) Impart 21st Century skills (literacy, information and communication, thinking and problem solving, interpersonal relations, collective learning and development of independent learners).

2.2.4 What is E-learning?

Electronic learning popularly referred to as e-learning; These are instructions that are delivered electronically, in part or wholly via a Web browser, through the Internet or an intranet, or through multimedia platforms such CD-ROM or DVD. E-learning involves the use of a computer or electronic device (e.g. a mobile phone, radio or television) in some way to provide training, educational or learning material (KIE, 2010). This however is not very inclusive since there is an obvious bias

towards the electronics. Although ICT has several definitions depending on the nature of its use in this review ICT is used as an umbrella term that includes any communication device or application, this includes television, radio, online learning management system, mobile apps, interactive boards, remote virtual learning as well as contemporary HTML / XML based learning such as blogging, chatting and posting. Our scope of ICT utilization covers preparation of learning resources, use of ICTs in teaching and learning as well as use of ICT as a teaching resource in conventional classrooms.

2.2.5 Dissemination of Digital content

The integration of ICT in the curriculum got a major boost in the financial year of 2011/2012 after the government allocated it some money through the economic stimulus package (ESP). This programme has benefitted one thousand and one fifty schools which were earmarked as pilot centers (KIE, 2011). Hundreds of schools have taken to self sponsor themselves through their school boards and parents initiatives to supplement the government efforts. Other mediums of dissemination include dedicated channels such as Edu channel on the digital platform, educational radio broadcasts all dedicated to the school curriculum.

Though many educational stakeholders at the school level view ICT in term of computers only, digital content can be disseminated using many mediums as supported by ISOC, OECD, UNESCO (2011). The radio is the main source of local content, especially in rural areas. This was on the background of the fact that above 80% of households has access to radio (ibid). This being the case, it will be worthwhile to carry out a research on how many schools utilize the ongoing school radio broadcasts.

This research targeted at evaluating the teaching and learning benefits accrued from these enormous investments (table2.1) which are made in terms of digital content development and dissemination for the secondary schools in Kenya The table represents the cost of developing one subject in one level of secondary education. There are over thirteen subjects and secondary education has four levels.

Activity	Cost KSH	Performance Indicator
E-content team training on emerging technology	562,500	25 Trained staff
Data gathering for Form3 and 4	3,000,000	Raw videos, photographs and models
Authoring of the digital content F3 and F4	516,000	DVDs with authored content
Editing/review workshop for F3	547,916	Edited scripts notes
Pilot/Review form3 materials	655,000	DVDs with content
Package content in DVDs	125,000	Packaged F3 content
Rollout of Form1 and Form2	125,000	DVDs with content to schools
Editing , review workshops for F4	446,000	Reviewed content
Elimika content development/editing for secondary Teachers	273,846	Online content for business studies
Teacher orientation F2F and online	562,500	Orientation report
Edu channel documentary	33,000	1 documentary
Total	6,746,762	

Table 2.1 Cost of developing digital content per subject

The race to input the infrastructure has seen major players join efforts in the provision of connectivity, hardware and software applications (table 2.2) to facilitate ICT integration in schools. For instance Intel has contributed over \$1 billion over the past decade to train six million teachers globally (Gitonga, 2009). The study intended to find out how all these digital resources are utilized in the secondary schools in Kenya and outlined the benefits accrued from these huge investments.

Projected costs for Implementation (Million Ksh)	2010- 2015
Primary	
Computer learning resource centers	23,017,629,695
Computer for teachers	6,042,127,795
Secondary	
Computer Learning Resources Centre	11,390,279,148
Computer for Teacher	2,698,489,744
Total	43,148,526,382

Table 2.2 Projected cost for e-learning implementation.

2.2.6 What influences development of digital content?

Since the adoption of FPE and tuition free secondary school the enrolled figures have more than doubled (Fig2.1). This has greatly affected the quality of education. The task force on education (MOE, 2012) pointed out that despite having the highest percentage of budgetary allocation over the last decade, especially since the launch of FPE and FDSE, quality remains a major issue across the entire spectrum of the education and training sector. ICT has the potential to “bridge the knowledge gap” in terms of improving quality of education, increasing the quantity of quality educational opportunities, making knowledge building possible through borderless and boundless accessibility to resources and people, and reaching populations in remote areas to satisfy their basic right to education. (ADB, 2009).

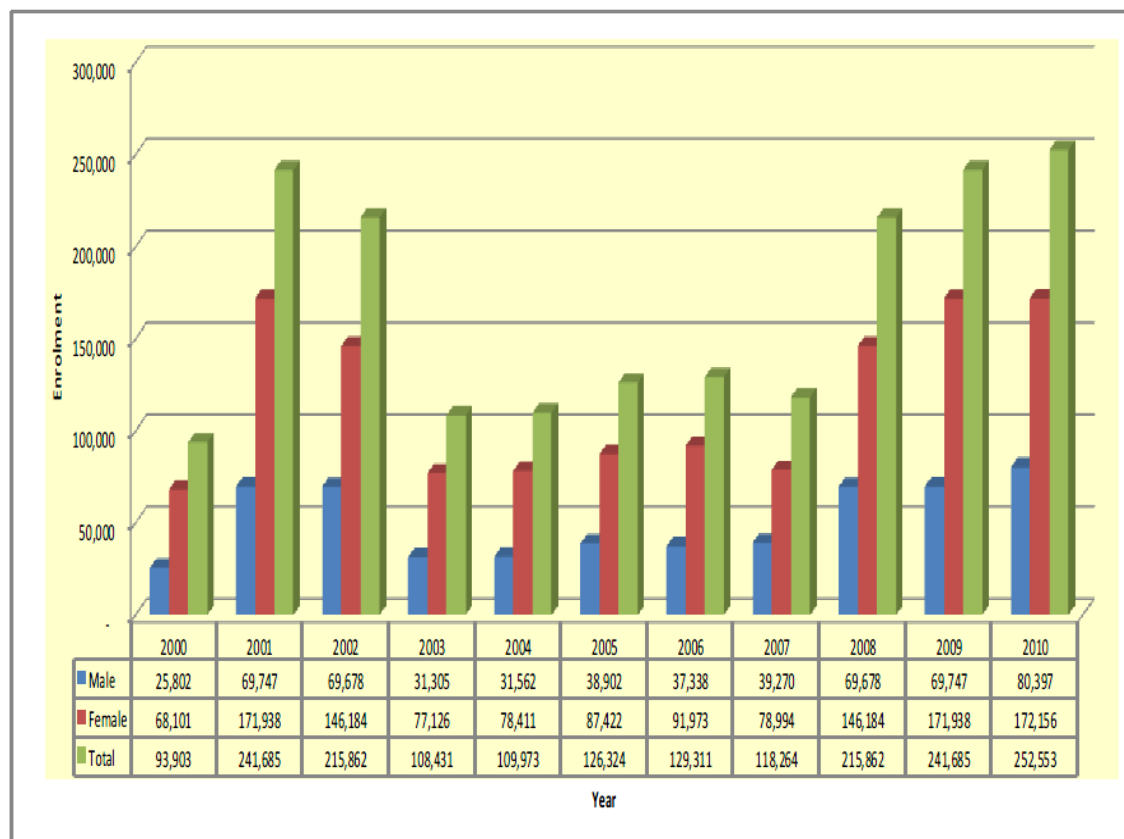


Fig 2.1 Enrolment figures for secondary schools

Source: Report of the task force

2.2.7 E-content utilization challenges

Uptake of digital content is hindered by many factors ranging from lack of basic skills to utilize the digital content to lack of infrastructure to support them. In a study of the pioneer e-learning school under NEPAD, Ogutu (2010) revealed some challenges faced by the schools. He listed lack of funding to support the purchase of the infrastructure to improve access to educational materials, lack of training for teachers to adopt ICT as a teaching tool as some of the challenges that hinder full integration of ICTs in education. This research found out that funding is the main challenge in sustainability of schemes and potential for further rollout are also highly uncertain once initial funding runs out; further support may be needed over the longer term. There is also need for MOE to coordinate dissemination of e-content and avail up to date data on all ongoing activities. Farrell (2007) added that the lessons learnt from readily available data would reduce unnecessary duplication and help newcomers to learn from both mistakes and successes of past projects. This documentation and availability of facts on digital content utilization in Kenyan secondary schools to the stakeholders in the education sector will result in good working synergy and minimize the proliferation of sub standard content.

Though resources are dedicated to make e-learning a reality, the ICT survey (2010) paints a grim picture on the state of schools for e-learning. According to this survey; Less than 45% of schools have access to internet services and only 32% have connectivity at the school. Most schools use mobile modems to get online which have less reliability and low bandwidth. The survey noted that the main use of Internet services is for communication purposes and observed that there is still a long way to ICT oriented education throughout the country.

Availability of computers is also a basic hindrance to e-content utilization. Due to the overwhelming bias in developing DVD based content this may be a challenge towards utility of e – content e.g. In Nairobi, 71% of schools have a computer but in the Eastern province less than 20% do . More statistics on availability of computers are shown in Table 3 and Table 4.

Table 2.3: Percentage of schools that have computers, by province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western	Kenya
% that has a computer	71.4%	44.3%	55.6%	19.4%	30.0%	34.2%	28.6%	36.0%	39.3%
Primary	63.4%	21.6%	36.2%	4.8%	17.4%	12.3%	14.8%	14.8%	22.0%
Secondary	93.3%	79.2%	82.4%	50.0%	71.4%	61.5%	65.2%	60.4%	68.0%

Source: 2010 ICT Survey

Table 2.4: Average number of computers per school, by province

Province	Primary	Secondary	Total
Nairobi	14	14	14
Central	5	13	11
Coast	10	13	12
Eastern	2	7	6
North Eastern	1	13	11
Nyanza Rift	3	10	8
Rift Valley	5	8	7
Western	2	10	9
Total	8	11	10

Source: 2010 ICT Survey

2.3 Digital content for effective teaching and learning

2.3.1 How is e-content utilized in schools?

How is the content utilized in the schools? Are the administrators locking up the content in a burglar proof laboratory for special occasions or is the information accessible at all times? Mildred et al, (2010) recommended ICT to be mainstreamed in all school subjects such that it would be seen in Geography, History, Business Studies, and Physics and so on. They emphasized the need for schools to have easy access to e-materials and the relevant ICT infrastructure including the internet to enable them work out the best approaches on integration in mainstream teaching. Whereas dissemination of digital content has been ongoing since the year 2006 most schools may not have put the e-learning resources to effective use. The ICT survey (2010) observed that almost half of the schools that have computers use them for administrative and other purposes different than teaching. Only 10% use computers only for teaching and 42% use computers for teaching and other activities. However, in provinces with low access to computers such as Eastern and North Eastern schools, schools use their computers mainly for administrative purposes (Table 2.5).

Table 2.5: Main Use Of The Computers In The School, By Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western	Kenya
Primary									
Teaching	4.2%	12.5%	43.8%	50.0%	0.0%	28.6%	14.3%	25.0%	20.3%
Administrative	29.2%	62.5%	43.8%	50.0%	100.0%	71.4%	28.6%	50.0%	44.6%
Both	58.3%	25.0%	12.5%	0.0%	0.0%	0.0%	57.1%	25.0%	32.4%
Other	8.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%
Secondary									
Teaching	7.1%	15.8%	0.0%	0.0%	20.0%	0.0%	6.7%	9.7%	5.9%
Administrative	28.6%	42.1%	48.2%	70.0%	60.0%	41.9%	66.7%	45.2%	47.4%
Both	64.3%	42.1%	51.9%	30.0%	20.0%	58.1%	26.7%	45.2%	46.7%
Other	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total									
Teaching	5.3%	14.8%	16.3%	8.3%	14.3%	5.3%	9.1%	12.8%	10.6%
Administrative	29.0%	48.2%	46.5%	66.7%	71.4%	47.4%	54.6%	46.2%	46.5%
Both	60.5%	37.0%	37.2%	25.0%	14.3%	47.4%	36.4%	41.0%	42.0%
Other	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%

1/Figures based on the institutions that have computers. Source: 2010 ICT Survey

Utilization of e-content is also influenced by the basic skill level of the teacher and administrators at the target institutions. Mildred et al, (2010) reported there was no positive correlation between the integration of ICT with the qualification of the teacher in ICT and much more, the teacher in charge. In as much as this was the case then, this study intends to find out if the teachers who have been taken through ICT integration orientation in digital curriculum materials have a higher level of access and are more creative in utilization of the e-content in pedagogy.

There are 0.7 qualified ICT teachers per school in Kenya (Table 6). Except for Nairobi and the Coast province, in all other provinces there is less than one qualified ICT teacher per school. In the schools that were surveyed, there are 448 qualified lecturers, 57% of which are male. *ICT Survey (2010)*.

Table 2.6: Average number of ict qualified teachers per school, by province 1/

Province	Primary	Secondary	Total
Nairobi	1.2	2.2	1.5
Central	0.5	0.6	0.5
Coast	1.8	2.7	2.2
Eastern	0.0	0.8	0.3
North Eastern	0.3	0.4	0.3
Nyanza Rift	0.2	0.6	0.4
Rift Valley	0.5	0.5	0.5
Western	0.1	0.5	0.3
Average	0.6	1.0	0.7

1/ Figures based on the institutions that have ICT subjects or courses.

Source: 2010 ICT Survey

2.3.1 Institutional based initiatives for digital content utilization?

The study has factored in creative solutions that schools have employed to make their institutions e-learning compliant. This includes effort to use alternative sources of power or generators. In Namibia, solar panels and wind turbines are being used to generate electricity to support Internet services, computers, and servers in rural areas. This type of infrastructure has, in part, enabled SchoolNet Namibia (see <http://www.schoolnet.na/>) to provide computers, training, and support to more than 300 schools via a significantly discounted flat-rate wireless Internet network. Affordable and reliable electric power would greatly facilitate the adoption of online learning (Clayton, Dhanarajan, & Reju, 2009). Much research in this regard has not been able to provide conclusive statements about positive or negative impacts (Claro, 2009). There has been a biased focus on specific countries in very specific conditions, such as in pilot projects or case studies.

2.4 Evaluating Framework

Evaluation is the process of determining significance or worth, usually by careful appraisal and study. Evaluation is the analysis and comparison of actual progress vs. prior plans, oriented toward improving plans for future implementation (www.sil.org, 2012). Evaluation can also be defines as A course of action used to assess the value or worth of a program (Farrell, 2007). The Joint Committee on Standards for Educational Evaluation has a recent draft of Program Evaluation Standards (Draft 3 2007). Previous versions of this set of standards are highly respected and often cited;

The standards provide sound guidelines to follow when having to decide among evaluation options. In particular, the standards help avoid creating an imbalanced evaluation (e.g., one that is accurate and feasible but not useful or one that would be useful and accurate but is unethical and therefore infeasible). These standards can be applied both while planning an evaluation and throughout its implementation (Barbara. 2008)

The motivation for the standards is to have an organized process that produces credible information.

The standards are categorized into the following four categories:

- **feasibility:** e.g. use resources efficiently and balance vested interests
- **propriety (ethics):** e.g. protect human and legal rights and be fiscally responsible
- **accuracy:** e.g. use sound qualitative and quantitative methods and report truthfully
- **utility (usefulness):** e.g. align evaluation purposes with stakeholder and user needs and encourage participants to revise their understandings

There are many methods of evaluation of ICTs in education, these include, Preliminary evaluation, Formative evaluation, Process evaluation, Outcome evaluation, Summative evaluation and Meta evaluation. This study will combine process and outcome evaluation and base the same on Khans dimensions. Khan's framework for e-learning (Fig 2.2) has eight dimensions which are crucial in evaluating the impact of e-learning. It's grounded on Pedagogical, Technological, Interface Design, Evaluation, Management, Resource Support, Ethical issues and Institutional.

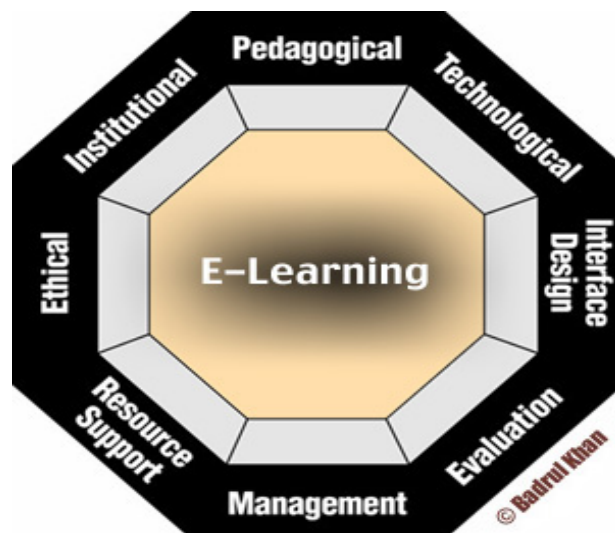


Fig 2.2: Khans E-LEARNING Framework

This study will focus on two pillars that will be framed on five dimensions of Khans model;

2.4.1 Utility:

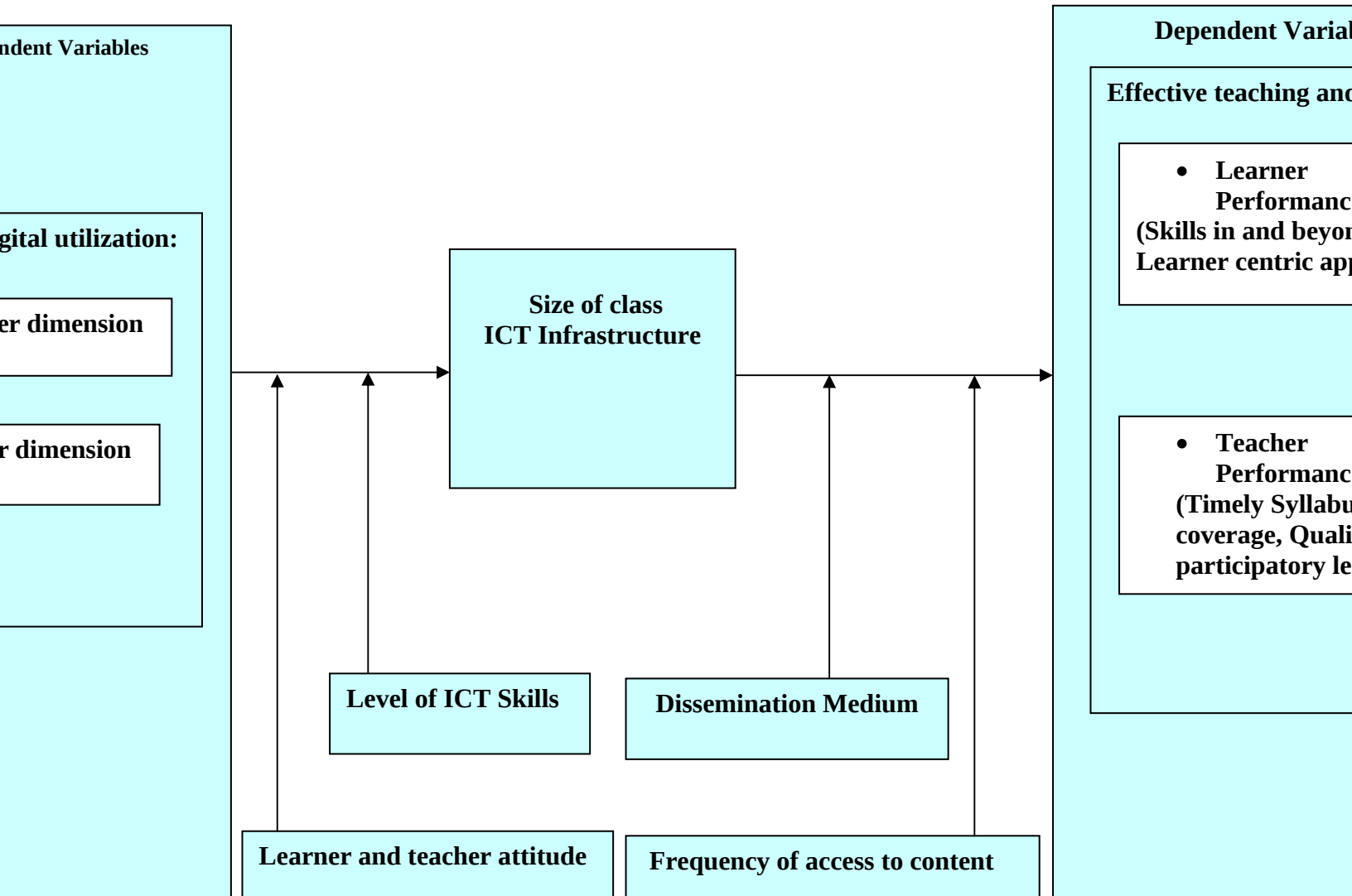
1. The **evaluation** for e-learning includes both *assessment of learners and evaluation of the instruction and learning environment*.
2. The **resource support** dimension of the E-Learning Framework examines the *online support and resources* required to foster meaningful learning environments.
3. The **ethical** considerations of e-learning relate to *social and political influence, cultural diversity, bias, geographical diversity, learner diversity, information accessibility, etiquette, and the legal issues*.

2.4.2 Pedagogical:

1. The pedagogical dimension of E-learning refers to teaching and learning. This dimension addresses issues concerning *content analysis, audience analysis, goal analysis, media analysis, design approach, organization and methods and strategies* of e-learning environments.

In order to justify the huge investments in e-learning there is need to evaluate the utilization of digital resources in order to have a clear path on our (EFA) focus and also to maintain access, equity and quality of education. The research has revealed that utilization of digital content is fraught with challenges. The stakeholders shared a few approaches in which they base maximization of digital content integration in pedagogy. The research findings propose a strong inclusion of digital content in mainstream learning through timetabling.

Conceptual frame work



3.0 METHODOLOGY

3.1 Introduction

This chapter provides the procedure that was used to carry out this study. The procedures are presented under the sub-headings; research design, study population, sampling procedure, the sample size, the data collection instruments and the data collection procedures.

3.2 Design

This research used a cross-sectional survey design approach to investigate various ways in which digital content utilization in Kenyan secondary schools and how these has affected the quality teaching and learning process.

3.3 Study Population

The population for this study comprised all the ICT compliant secondary schools in the Country. This study targeted head teachers, teachers and learners. All the respondents selected were involved in teaching and learning process either directly or indirectly thus they provided relevant information and views on level of e-content penetration and utility in their schools.

3.4 Sampling Procedure

A representative sample was drawn from within selected counties. The counties are divided into constituencies; the target schools came from different constituencies. Nairobi County was used to pilot the tools. A list of schools in the different constituencies was run in the computer and schools picked at random. The same method was used to pick the teachers and students in the targeted schools. To avoid any extraneous variables such as a school picked lacking an e-learning programme some element of intervention was applied to ensure the targeted schools are e-learning compliant. This method was duplicated in several other counties to get a study sample with a national outlook. The random list picked was altered due to

logistics e.g. schools that had special events, schools that failed to respond due to unforeseeable reason were dropped and new ones picked. These affected only 5 schools and the replacement was selected from the same county to balance any unique regional disparities. 23 schools were sampled in 15 different counties.

3.5 Sample Size

The study targeted at least two schools per county, which comprised ESP supported secondary schools. Students were selected randomly from the class register to avoid any bias when using records such as examination analysis sheets. Stratified random sampling was used to mitigate on bias within the sorted data in class registers. To eliminate bias in the subjects; the teachers were e also blocked then picked at random from the respective subject. Gender disparity was controlled through blocking and use of dedicated quotas.

Item Description	No of Items
Responding Schools	103
Study Counties	15
Responding Teachers	103
Responding Principals	22
Responding Students	93

Table 3.1 Respondents Characteristics

Item Description	No of Items
Rural Schools	41
Urban Schools	62
Private Schools	14
Public Schools	89
Male Respondents	69
Female Respondents	55

Table 3.2 Respondents Characteristics

3.6 Data Collection Instruments

The study used questionnaires that were administered to the selected sample of head teachers, teachers and learners. A questionnaire was adapted from Kenya Institute of Education research No 99 which targeted e-learning readiness among secondary schools in Kenya and customized for the study. It had a reliability index of $\alpha = 0.835$. Questionnaires have been chosen due to a number of factors;

- The target schools are spread all over and in may be impossible to reach out to all the schools within the period of the study.
- Questionnaires offer an economical way of getting feed back as no face to face is required to meet the respondents.
- They allow use of emails as a mean of reaching out thus making them faster and time saving.

The questionnaire was available in both hard and soft version through an online portal

<https://ict4educationkenya.blogspot.com> . The different questionnaires were tested through a pilot study in Nairobi County which is populous and highly cosmopolitan. The county has a substantial

number of schools which have adopted e-learning through the ESP programme (Appendix 7.2) and self sponsorship. The piloted study got responses from 18 respondents whose data was coded and analyzed for reliability. The questionnaire recorded a Cronbach alpha of 0.535 since the respondents gave feedback which was below expectation. Cronbach's alpha is a measure of internal consistency i.e. how closely related a set of items are as a group. For most social science research situations a cronbach alpha of 0.70 is considered acceptable. For this reason consultation with expert researchers from UoN and Aga Khan University and a walk through question by question were carried out and guided changes made. A retest of the questionnaire was done and a Cronbach alpha of 0.917 was attained. Cronbach's alpha was used to measure internal consistency ("reliability"). The use of multiple Likert questions in the questionnaire necessitated the use of cronbach Alpha to determine the reliability of the scale. The open ended question were coded and qualitatively analyzed for consistency, readability and reliability.

Research Question	Variables	Operational Definition	Research method	Scale	Respondents	measures
How is the content used in/out of schools?	Availability of digital content	% of teachers using digital content (DG)	Survey	Interval	Principals Heads of department	Rating Mean deviation
		Different Types of access modes used by teacher/learners	Survey	Ordinal	Teachers Students	Rank Median
How is digital content access within the school?	Frequency of digital content Use in class	Number of subjects using DG.	Survey	Ordinal	Teachers Students	Rank Median
What impedes access of available digital content?	Syllabus coverage	% of content covered as per curriculum	Survey	Interval	Principals Teachers	Rating Mean deviation
What factors influence utility of e-content in schools	Teaching approach(real time evaluation)	Teaching success/ Performance	Survey	Interval	Teachers Students	Rating Mean deviation
How the schools utilizes digital content	Skills beyond class	Utilizing ICT tools outside class	Survey	Interval	Teachers Students	Rating

Table of variables

Research Plan Schedule

The effect of digital content utilization on teaching and learning in Kenyan secondary schools

Objective	Action/Activity	Carried out by:	Target dates	
Proposal	Present proposal to panel	Researcher	16/11/2012	Done
Teachers from centres within centres.	Recruited enumerators and collect contacts Brief and train on expected tasks	Teachers Principals	26 /11/2012 TO 12/12/2012	Done
Students	Carried a survey in Nairobi and Embu counties.	Researcher Teachers Principals Students	14/01/2013 TO 25/01/2103	Done
Final Survey	Disburse the questionnaires to the enumerators in the database.	Researcher	28/01/2013 TO 31/01/2103	
Feedback	- Contact the enumerators and prompt for feedback - Visit sample schools (if possible) and collect feed back - Check online repository for data	Researcher	01/02/2013 TO 15/02/2103	Done
	Code the collected data	Researcher	16/02/2013 TO 18/02/2103	Done
Data	Analysis of data by tables, bar graphs, pie chart and percentages.	Researcher	19/02/2013 TO 22/02/2013	Done
Analysis of	Conclude the research and write the final report.	Researcher	23/02/2013 TO 28/02/2013	Done
Conclusion	Present findings	Researcher	March 2013	

Research Plan Schedule

3.8 Data Collection Procedure

The area of coverage was wide given the research time span of three months. The study enlisted the use of well coordinated enumerators, an online portal, short messages with the link and phone calls in collection of data. The questionnaires went through the county Director of Education/ school principals to get support and legit entry point into the schools within their jurisdiction. Questionnaire one was administered to the Principal/ head teacher in each of the schools visited and questionnaire two was given to three teachers representing sciences, humanities and languages in each school. The learners were also segmented from second year of secondary school to the last year of secondary school and questionnaire three administered to them.

In case of mixed schools the balancing of boys and girls was done as per the registration records to ensure a representative sample is used.

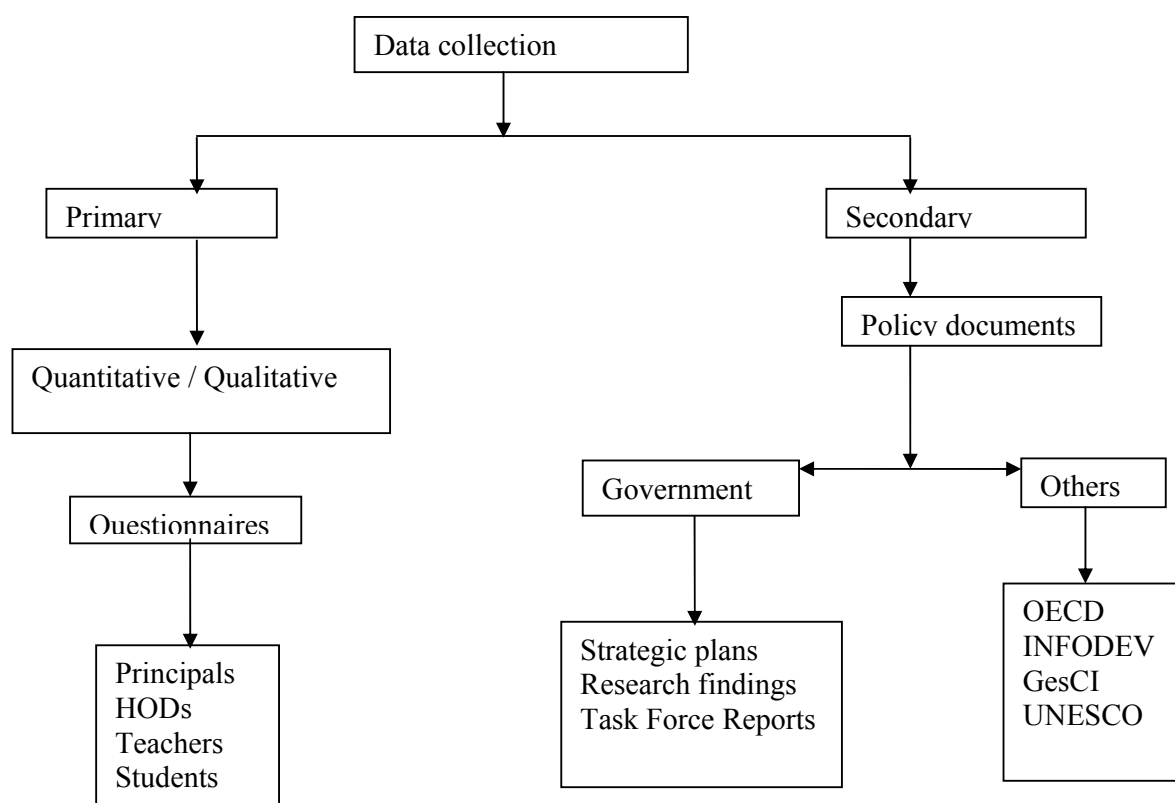


Fig 3.1 Data Collection

3.9 Data Analysis

Data analysis is the process of simplifying data to make it comprehensive and to give meaning to the data which was collected systematically by use of the research instruments. The research instrument used in this study was a questionnaire. The questionnaires were developed for teachers, learners and head teachers/principals. The data captured using questionnaires was systematically organized and coded. All the related items in the questionnaires were tallied with the number of the respondents. The results were presented by using tables, bar graphs, pie chart and percentages.

4.0 DATA ANALYSIS

RESEARCH FINDINGS AND DATA ANALYSIS

4.1 Respondents characteristics

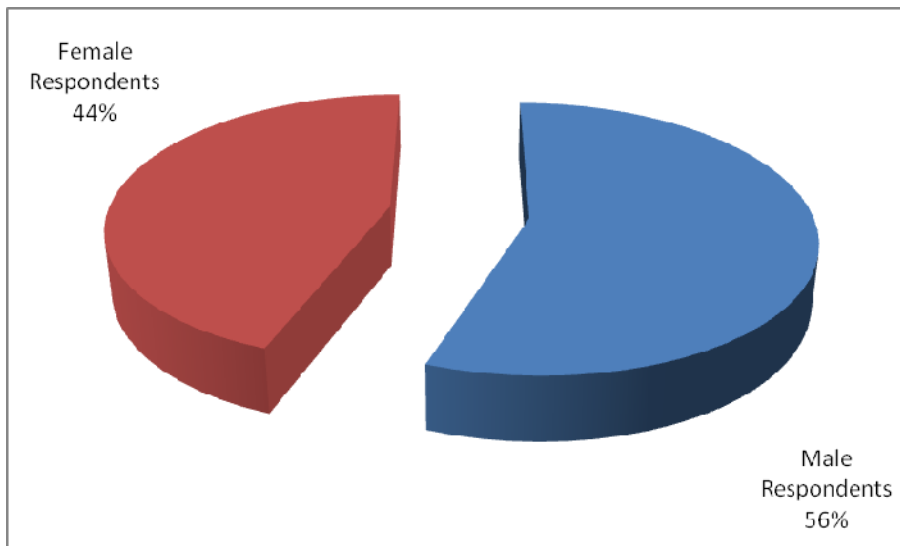
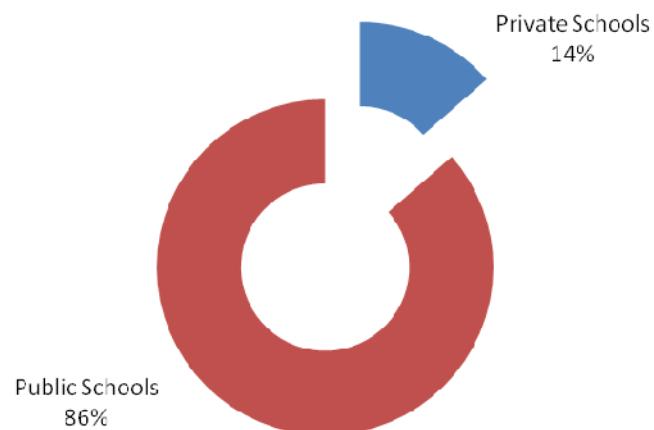


Fig 4.11 Respondents by gender

The male respondents constituted 56% whereas their female was 44% of the total respondents. This reflects the proportion of male to female in the study population.

Respondents by Type of School:



Among the respondents 86% were from public schools as 14% came from private schools.

Fig 4.12 Respondents by Type of School

Respondents by School setting:

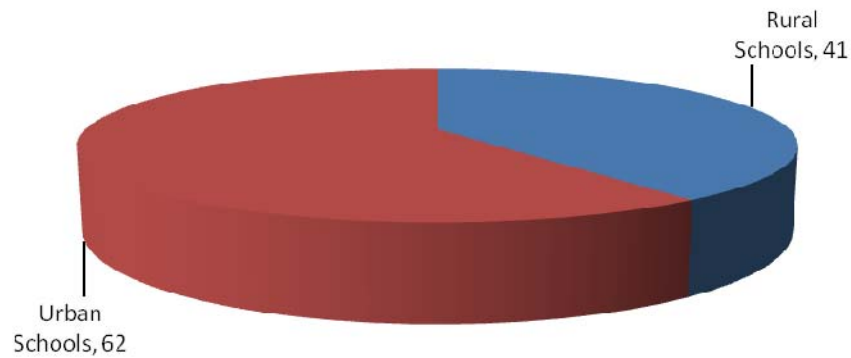


Fig 4.13 Respondents by School setting

62 of the respondent's schools were from urban areas as 41 came from rural schools.

Respondents by experience in years in the current post

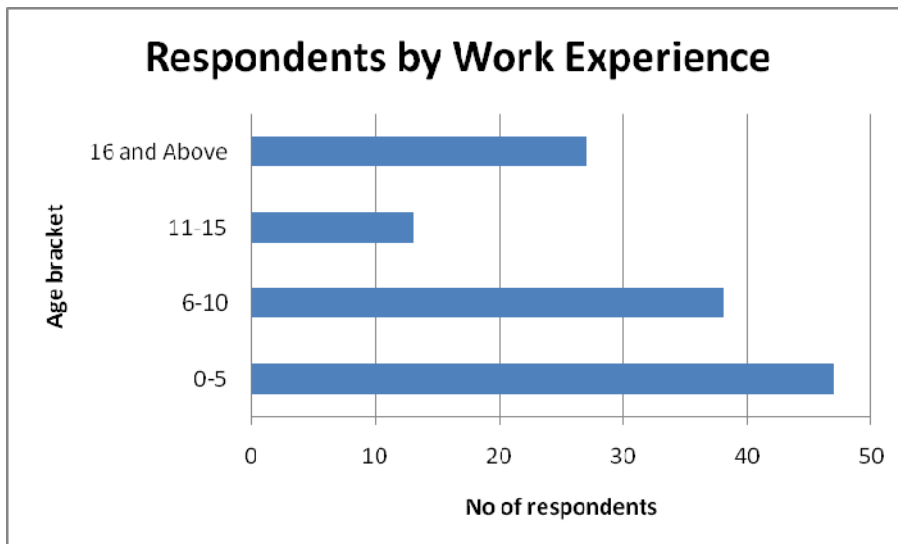


Fig 4.14 Number of respondents by experience in years in the

Among the respondents 68% have worked for 10 years or less. The highest number of respondents was from those the cluster of those who have worked for five or less years.

4.2 Utilization of e-content and its effect in secondary schools

Which of these tools have you ever used? (Choose all that apply)

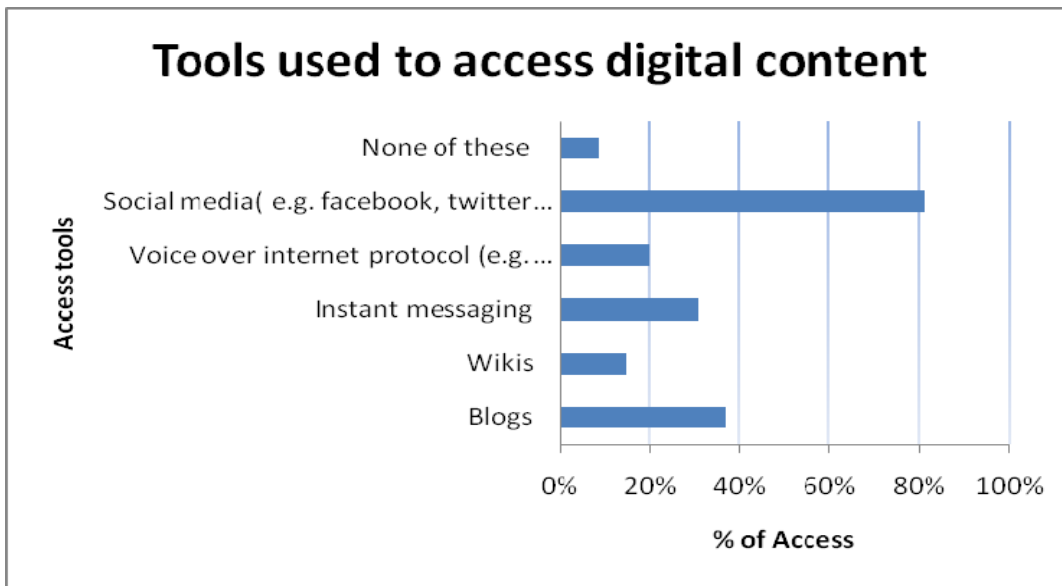


Fig 4.21 *Fig 4.21 indicates that learners have more access to social media (81%) than any other mode of online interaction.*

Which of these do you use regularly? (Put a tick on all that apply)

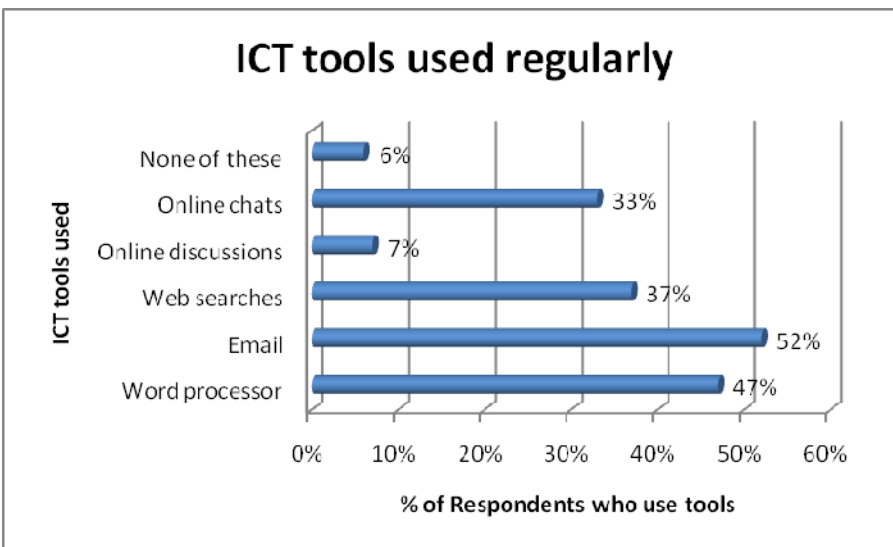


Fig 4.22

Fig 4.22 indicates that majority (52%) of learners have regular access to emails. A good portion (47%) makes use of a word processor on a regular basis.

Digital content has been integrated into the teaching and learning process

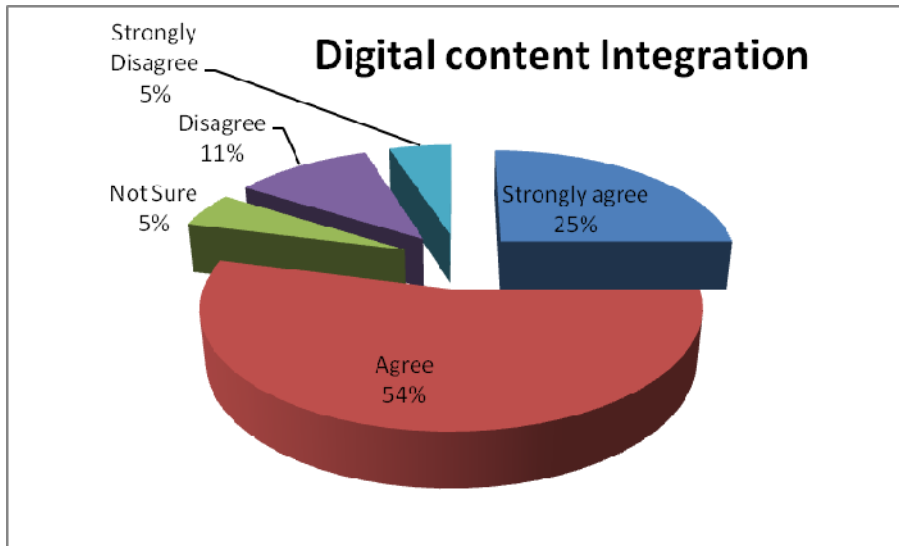


Fig 4.23

Fig 4.23 shows that a good proportion of teachers (25%) were of the view that digital content has been integrated into pedagogy. 54% agreed on the same point making a total of 79%.

Digital content enhances learners understanding of concepts

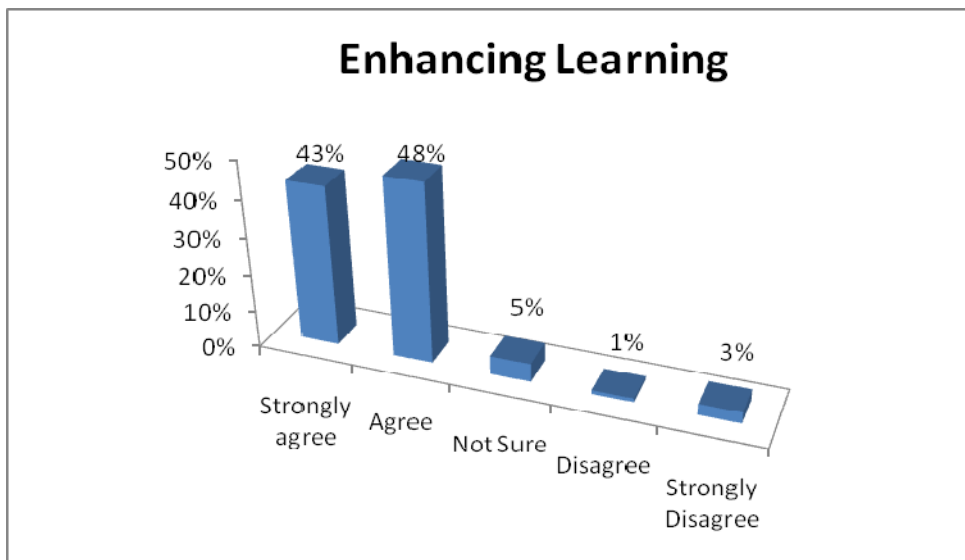


Fig 4.24 *It was observed that 43% of the respondents were of the strong view that learners understand better with digital content as 48% agreed on the same.*

Digital content can replace the role of teachers in a classroom

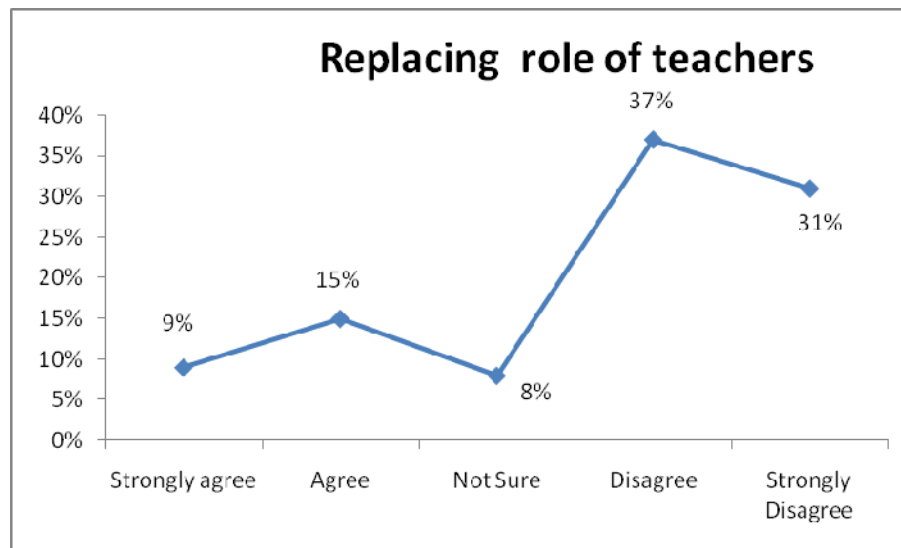


Fig 4.25 From fig. 4.25 68% of the respondents are of the view that teachers cannot be replaced by digital content. 31% strongly took this view as 8% were not sure. Only 24% supported the view that e-content can replace teachers.

What ways do you use digital content in the pedagogy?

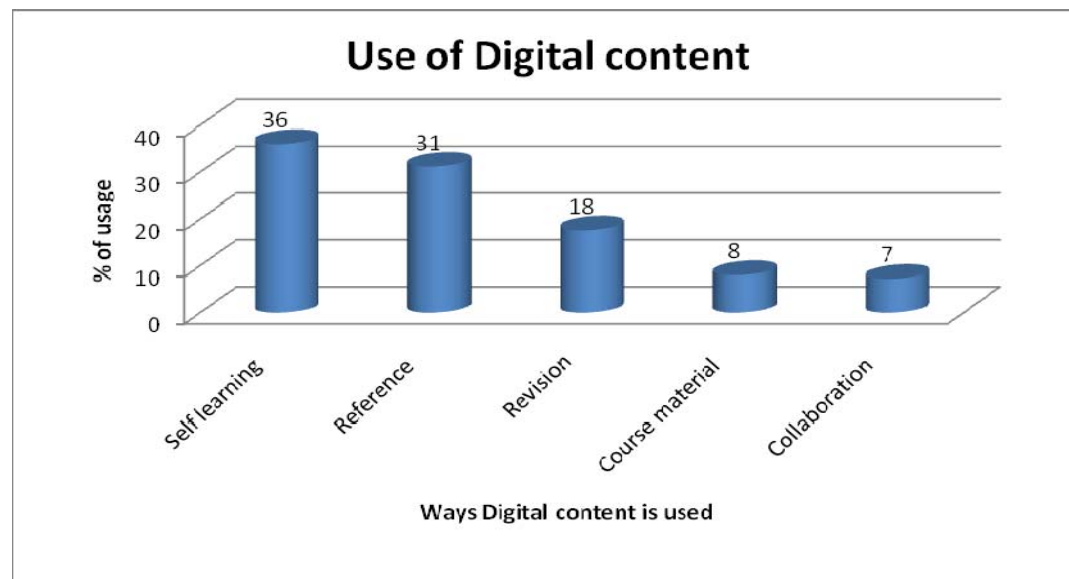


Fig 4.26 It was observed that majority of the respondents use digital content for self learning (36%), reference (31%) and revision (18%). For course material only 8% use it while 7% use it for collaboration.

Digital content has reduced teachers' workload

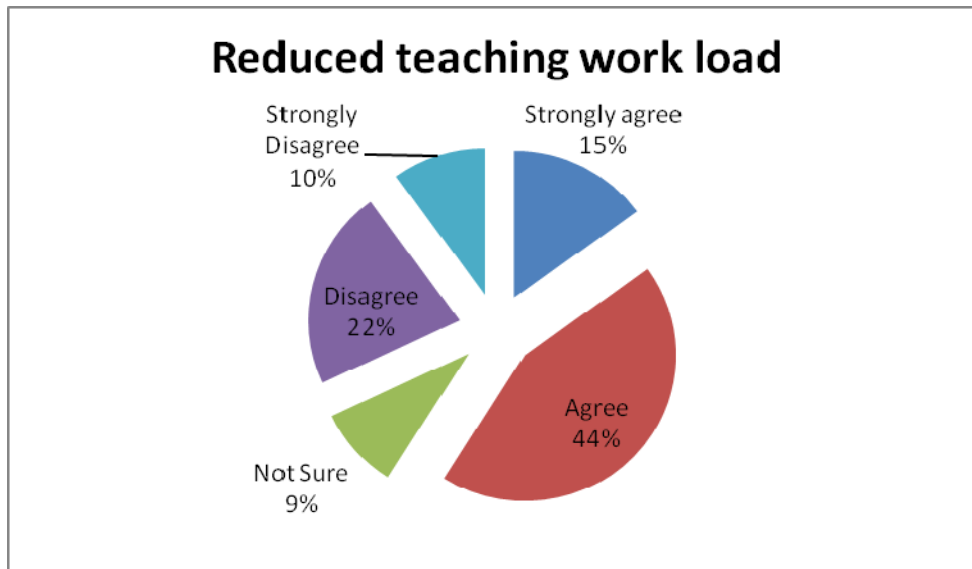


Fig 4.27 Among the respondents 59% were of the view that digital content reduces teacher workload as 32% were of the opposing view. 9% were not sure of this.

Digital content has improved the quality of classroom teaching and learning

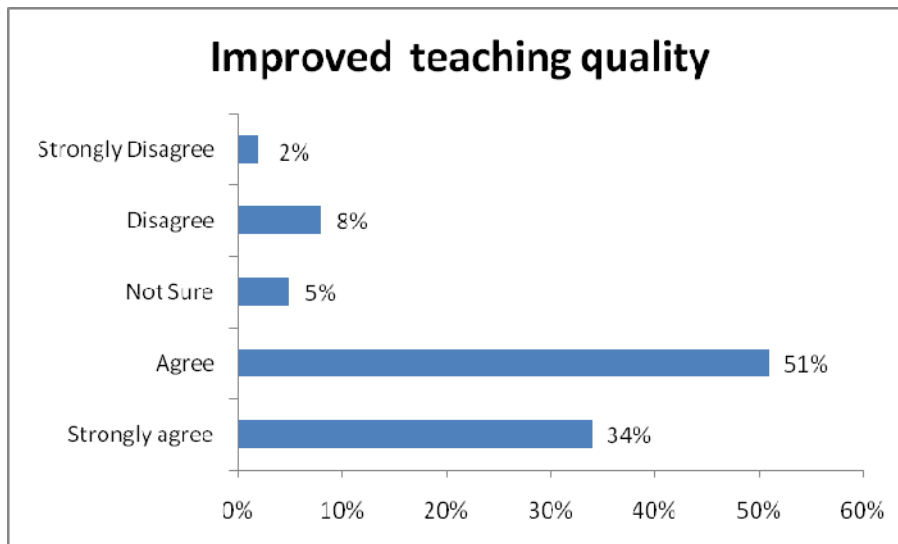


Fig 4.28

The figure 4.28 shows that 84 % of the respondents are of the view that digital content has improved the quality of pedagogical process.

Digital content has enhanced learner's concentration in class

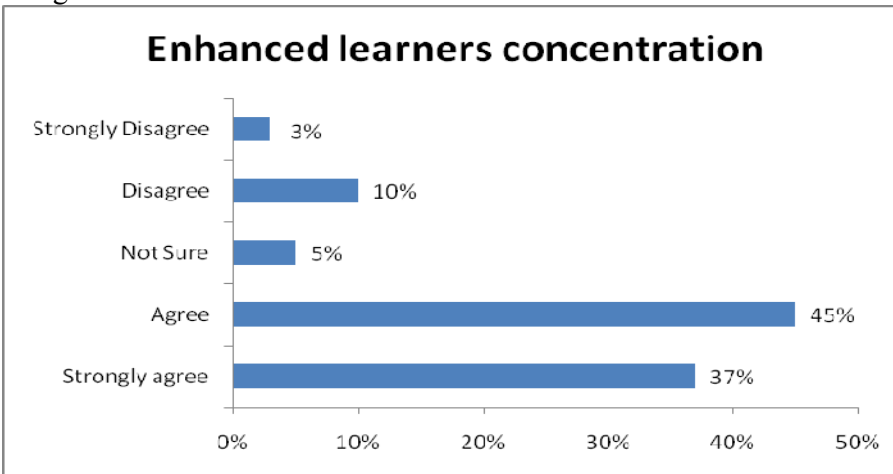


Fig 4.29 *82% of the respondents observed that digital content enhances learner's concentration.*

Digital content resources enhance delivery of content in teaching and learning.

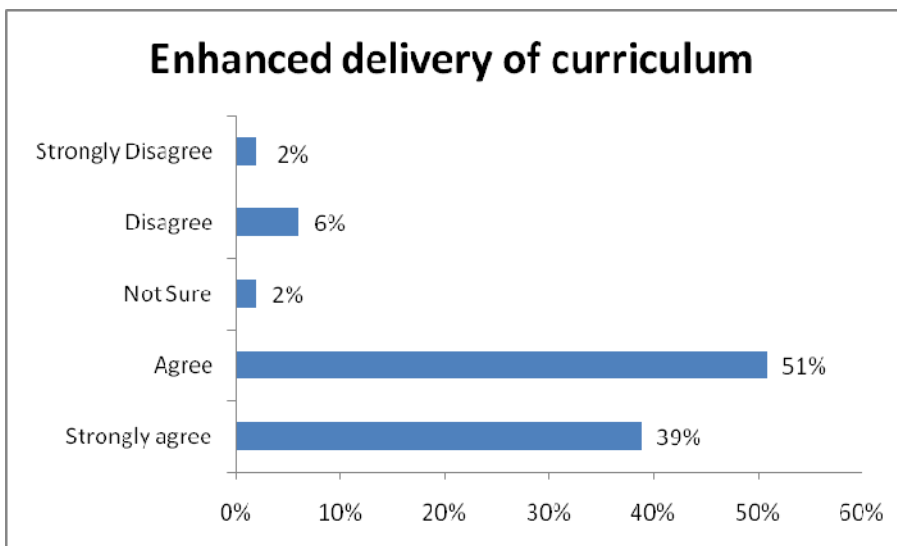


Fig 4.210 *90% of the respondents were of the view that digital content enhances delivery of content while 8% disagreed.*

4.3 How digital content is accessed in the secondary schools

There is easy access to digital content within the school.

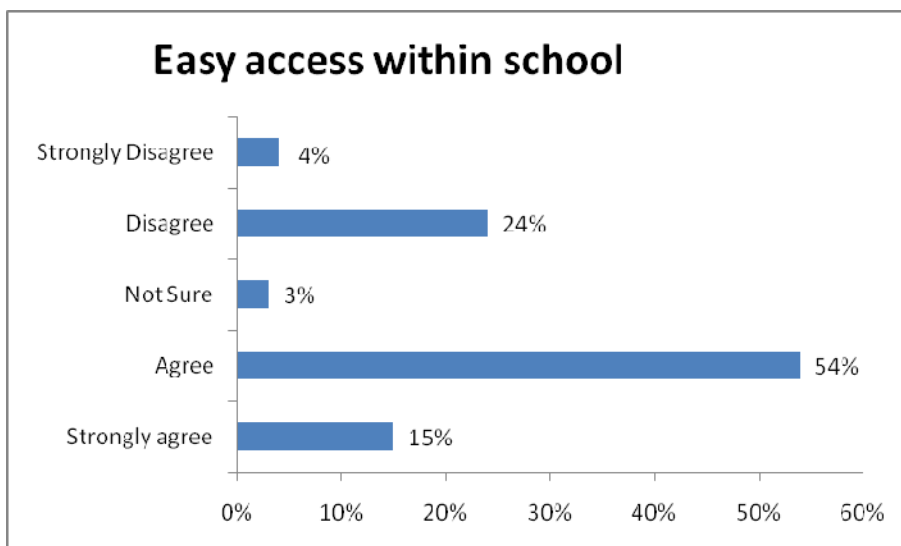


Fig 4.31 69% of the respondents expressed the opinion that digital content is readily accessible within the school as 28% disagreed.

Digital materials to support curriculum are readily available and accessible

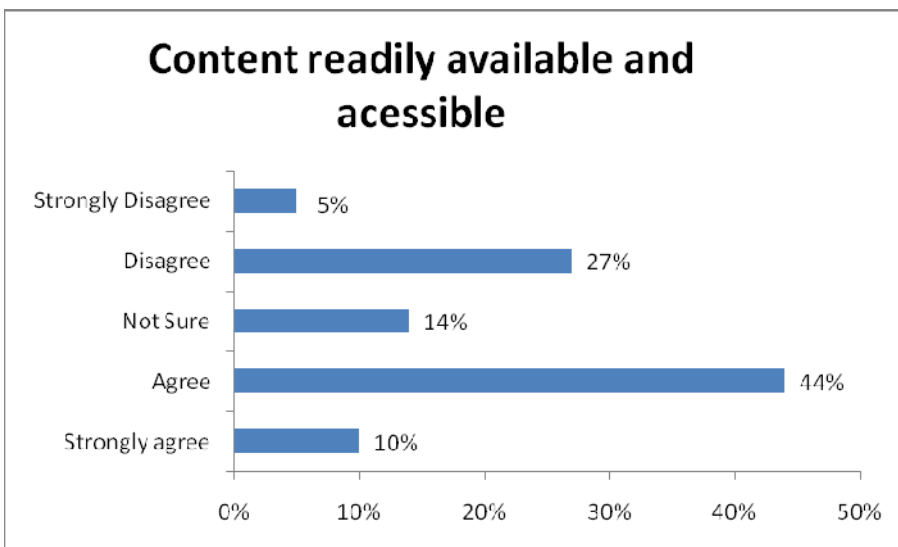


Fig 4.32 On availability of e-content 54% of the respondents were of the view that it's available and accessible while 32% disagreed with this view.

There is easy access to digital content outside school.

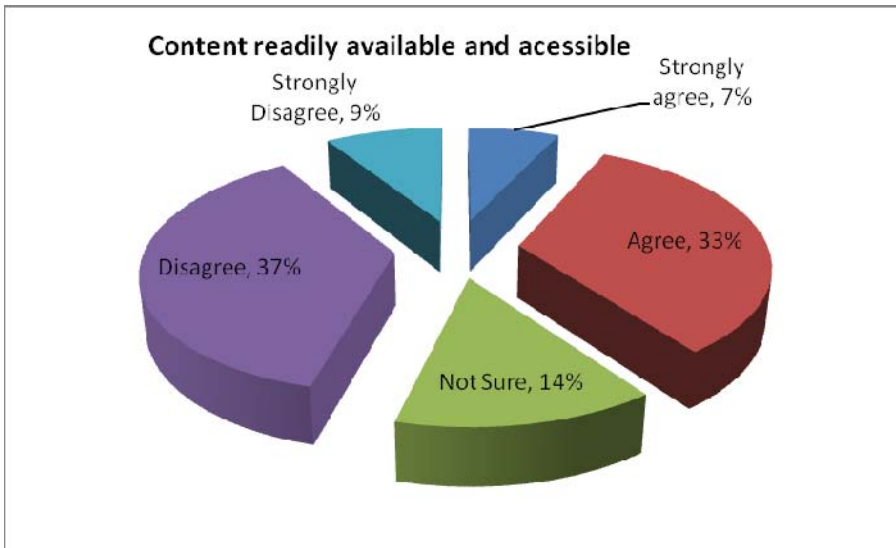


Fig 4.33 40% of the respondents were of the view that digital content can be accessed easily outside the school as 37% disagreed.

4.4 Challenges that impede access to available digital content

Challenges faced when using digital content

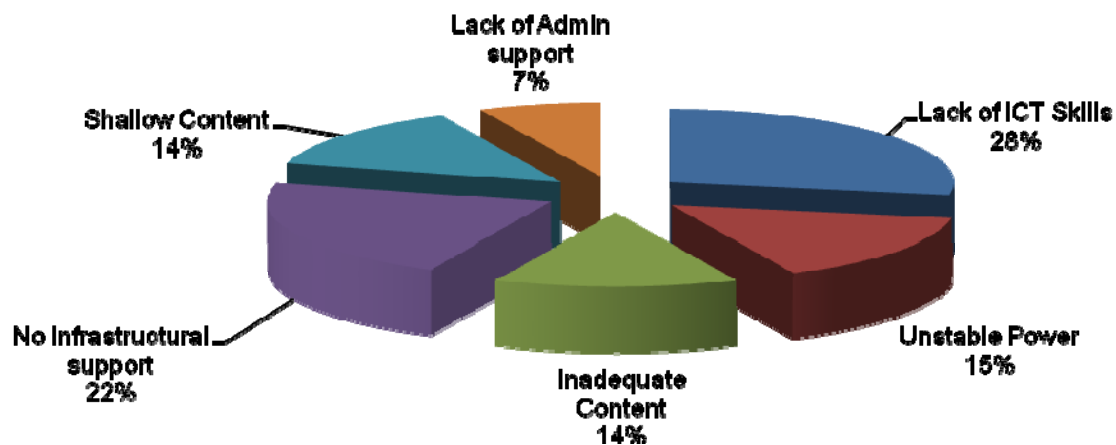


Fig 4.41 Challenges faced when using digital content

The respondents listed a number of factors that hinder the effective use of digital content. Lack of skills was cited as the highest (28%) factor followed closely by lack of infrastructural support at 22%.

Where did you get your experiences of using digital content?

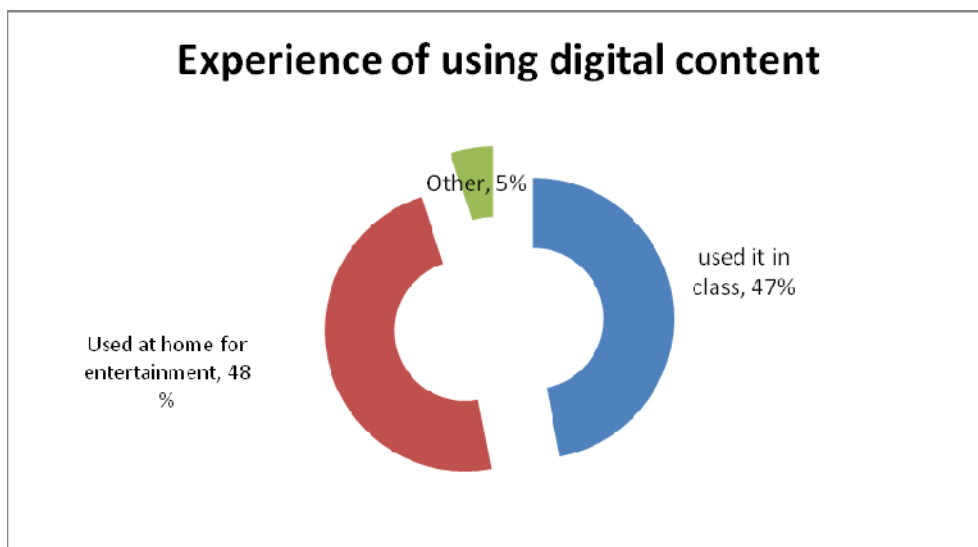


Fig 4.42

Majority of the respondents 48% interact more with the digital content at home while 47% use it at school.

The infrastructure in my school supports access and use of e-learning material

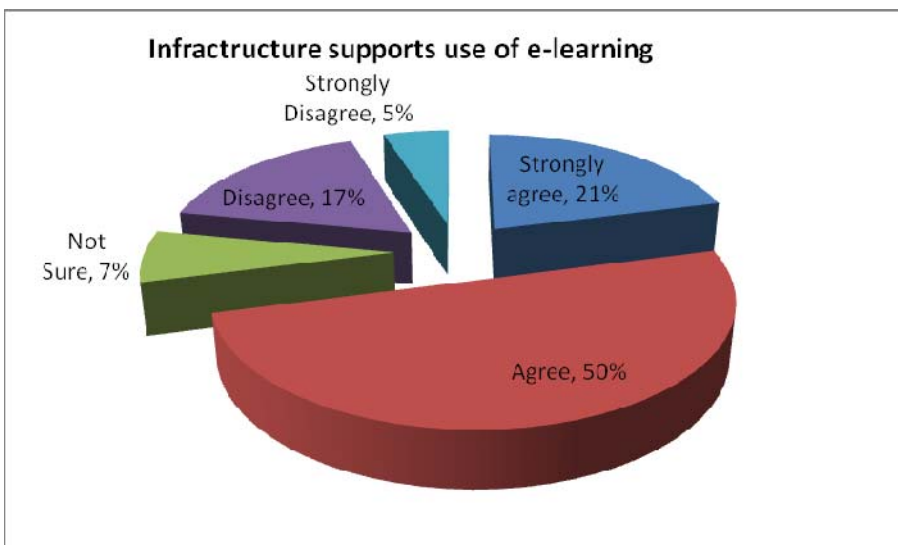


Fig 4.43

71% expresses availability of supportive Infrastructure as 22% were of the contrary view.

The digital content uses tools that are easy to understand and utilize in class.

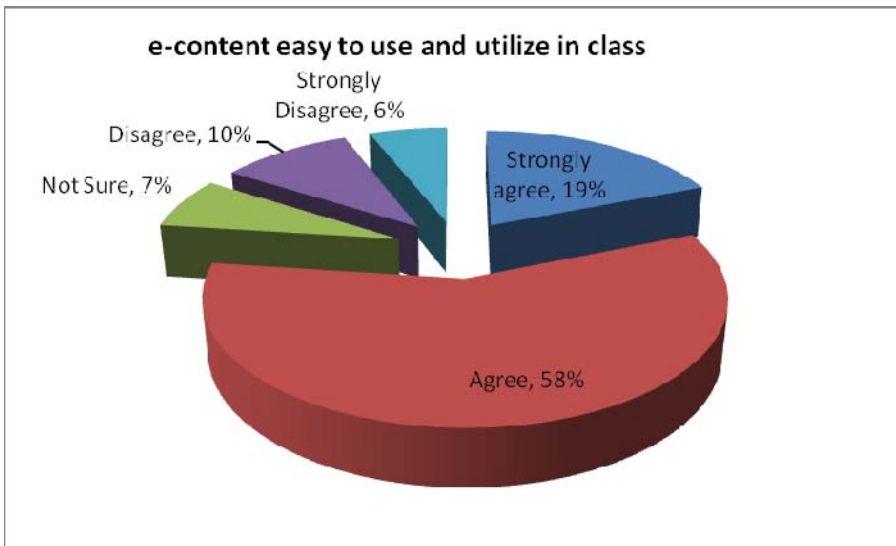


Fig 4.44

Majority of the respondents 78% were of the view that e-content is easy to use as 16% disagreed with this view.

How would you describe your initial access to the digital content?

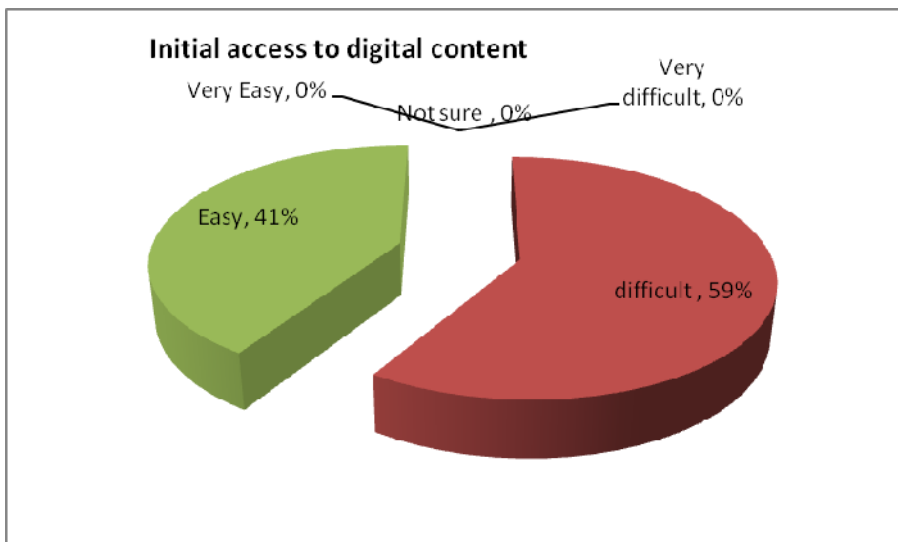


Fig 4.45

Most respondents initial access to content was difficult (59%), only 49% found it easy.

The manuals gave me the information I needed to learn about and prepare for the digital content.

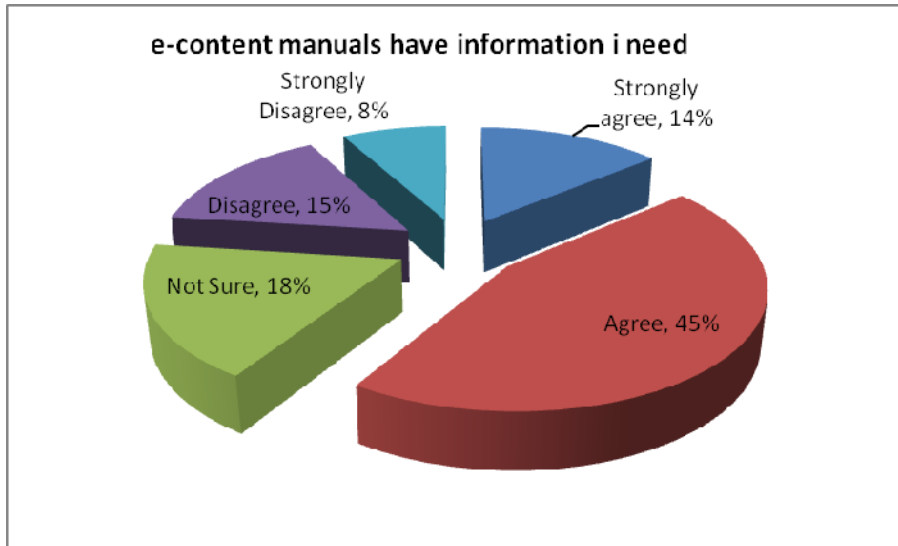


Fig 4.47

69% of the respondents were satisfied with the manuals for digital content as 23% were not.

Previous experiences of using digital content?

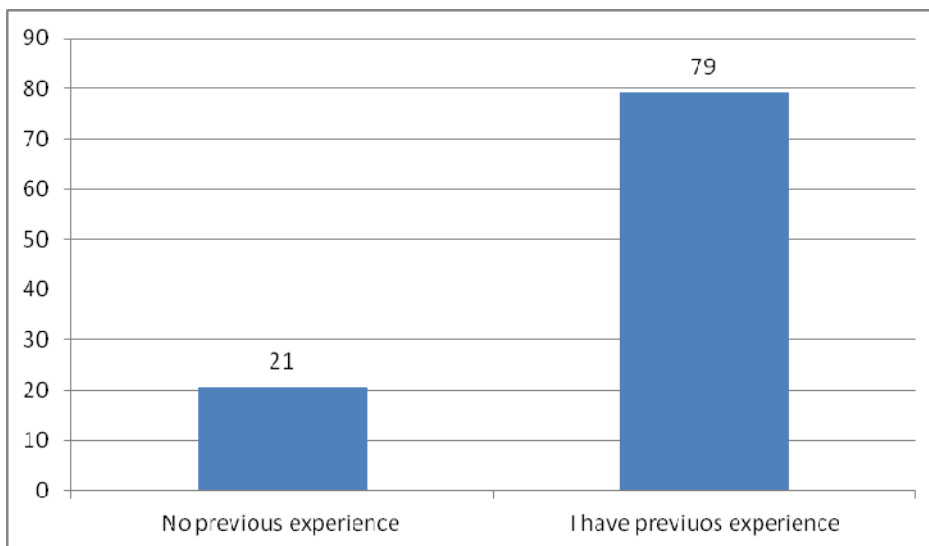
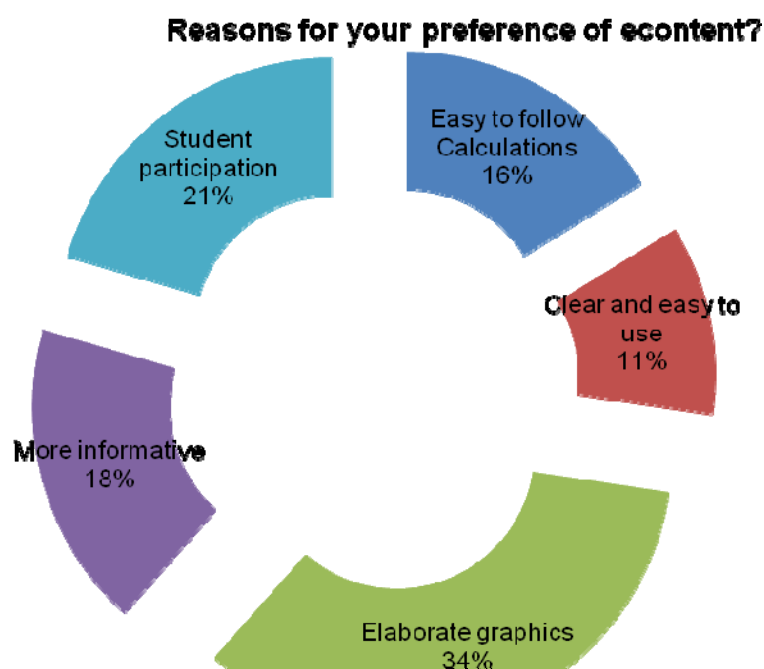


Fig 4.48 Previous experiences of using digital content

79% of the respondents had previous experience with digital content while 21% didn't.

4.5 Benefits the student/teacher has derived from utilizing digital content



The respondents expressed a number of benefits on digital content use. Elaborate graphics was the best at 34% followed by more student participation at 21%, and more informative content at 18%.

I have been able to integrate e- learning resources into the teaching and learning process in my subject.

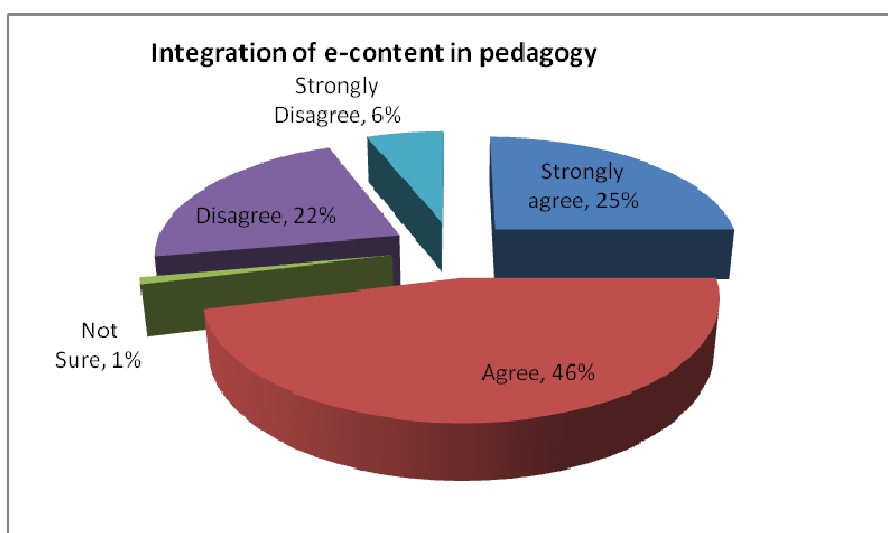


Fig 4.52 *e respondents viewed that they have integrated e-content into pedagogy as 28% disagreed.*

e- Learning resources have enhanced my understanding of concepts in my subject

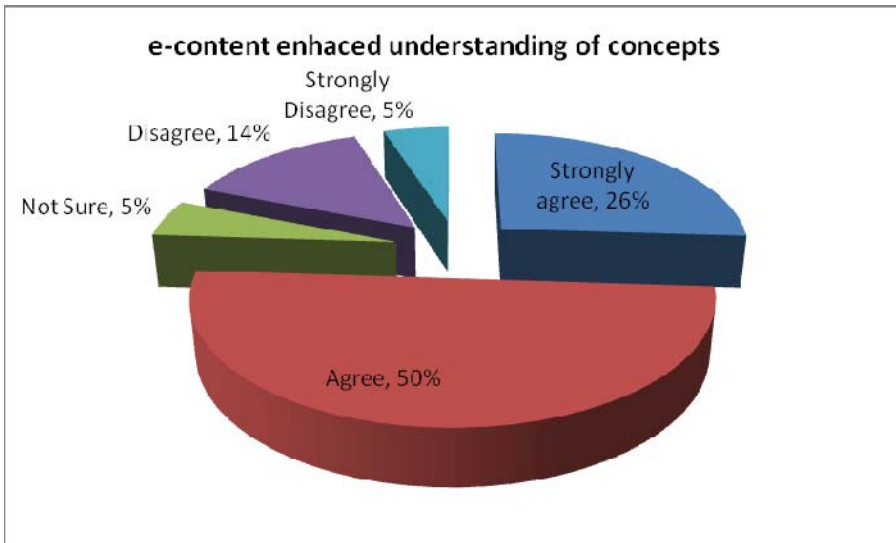


Fig 4.53

76% of the respondents expressed better understanding of concepts as 19% disagreed.

I feel e-learning has improved the quality of classroom teaching and learning.

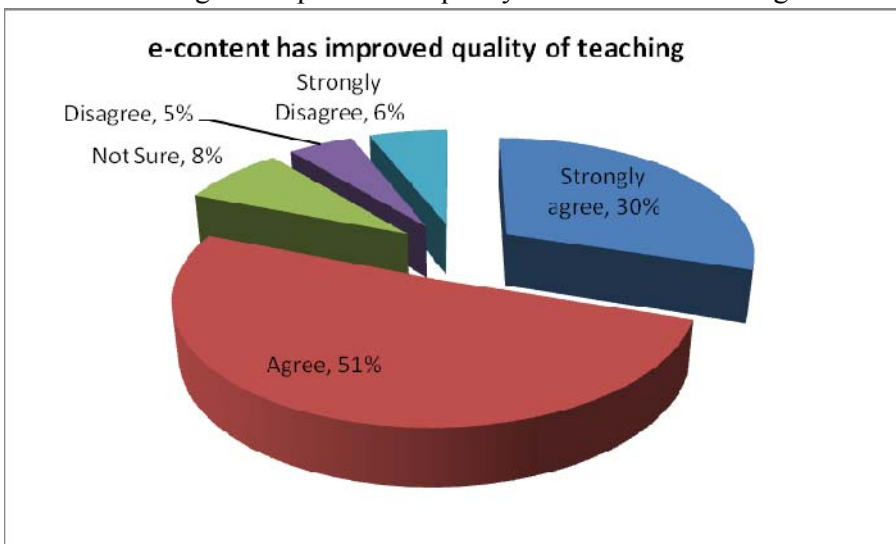


Fig 4.54

Majority (81%) of the respondents were of the view that quality of classroom teaching has improved.

4.6 Factors that influence utilization and access of e-content within the school

The content is packaged in an easy to use format:

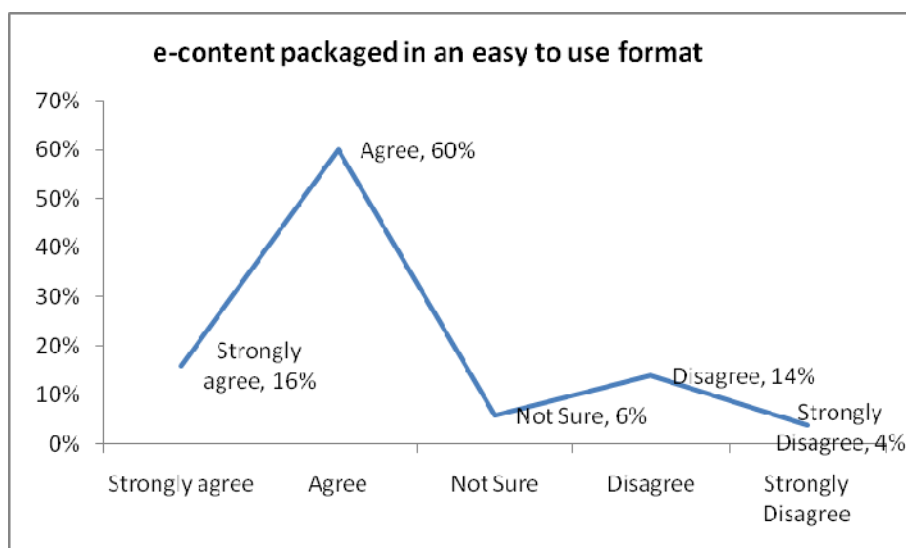


Fig 4.61

76% of the respondents were of the view that the digital content is packaged in an easy to use

format as 18 % disagreed.

The content has covered all areas of the curriculum in my subject

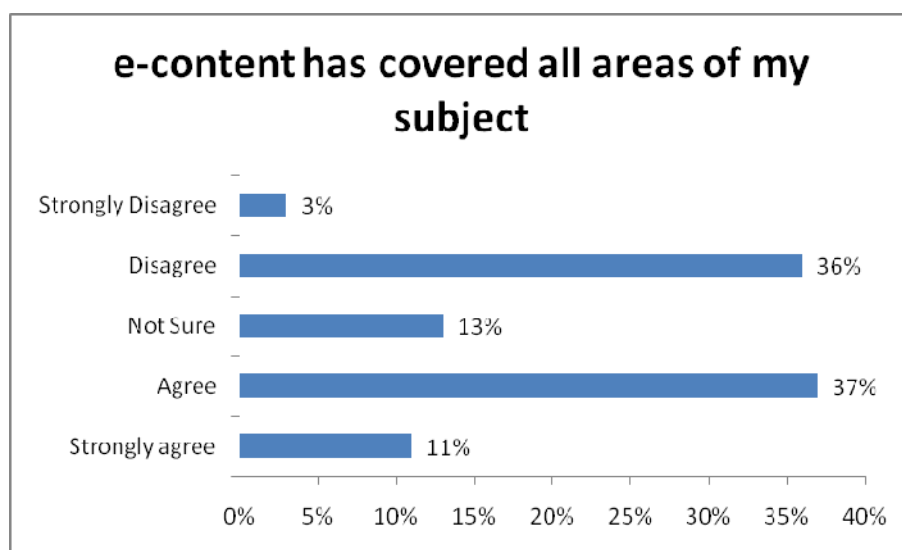


Fig 4.62

48% of the respondents agreed on curriculum coverage as 39% disagreed.

Digital materials to support curriculum are readily available and accessible.

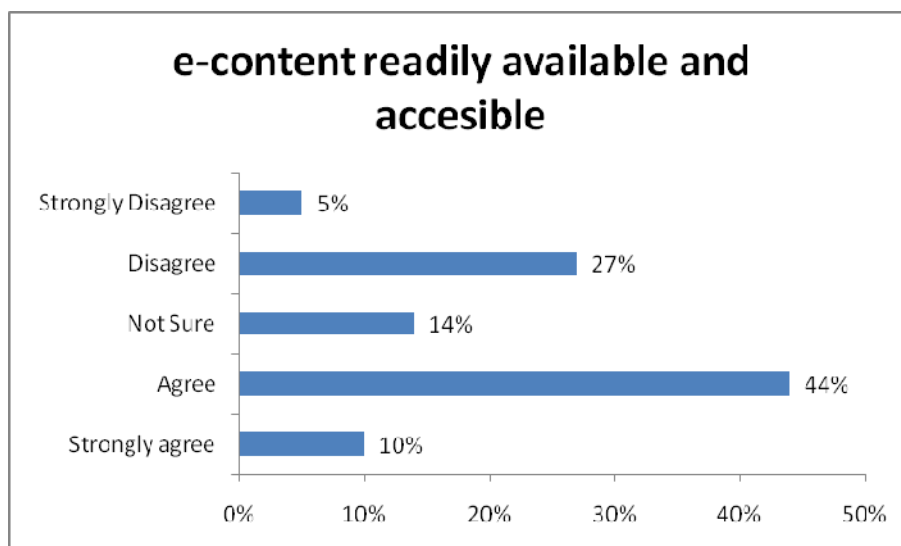


Fig 4.63

54% viewed that e-materials are easily available as 32% disagreed.

Digital Curriculum support materials are readily available in multiple formats.

(CDs, DVDs, Audio cassettes, radio, VHS and web based access)

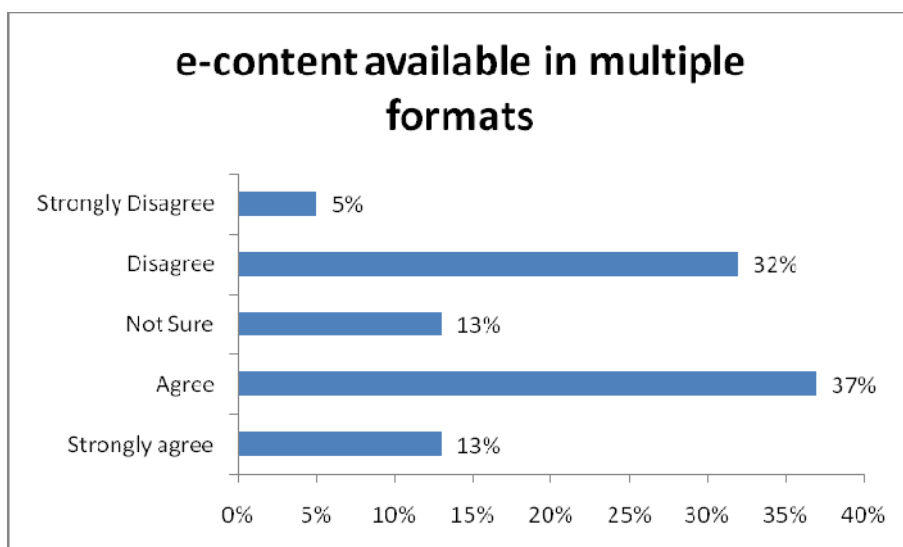


Fig 4.64

48% expressed that a variety of format are available as 37% disagreed.

4.7 Possible solutions to the challenges of using digital content in teaching and learning

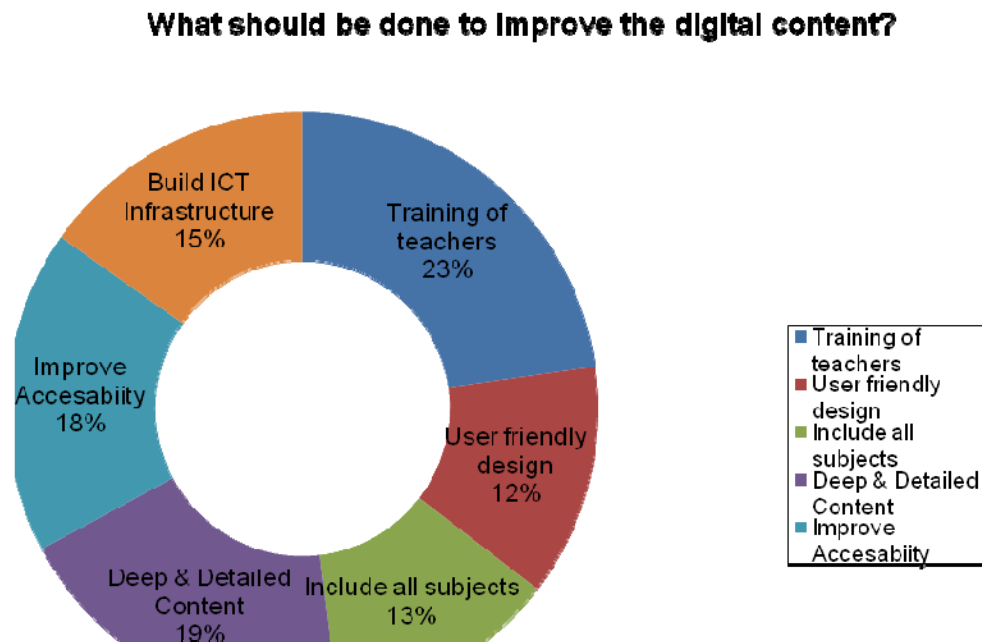


Fig 4.71 what should be done to improve digital content?

4.8 Cross tab analysis of variables

I feel e-learning has improved the quality of classroom teaching and learning * I have been able to integrate e- learning resources into the teaching and learning process in my subject. Cross tabulation							
Count							
		I have been able to integrate e- learning resources into the teaching and learning process in my subject.					
		1	2	3	4	5	Total
I feel e-learning has improved the quality of classroom teaching and learning	1	13	13	1	4	0	31
	2	6	37	1	7	2	53
	3	0	5	2	1	0	8
	4	0	2	1	1	1	5
	5	0	0	0	1	5	6
Total		19	57	5	14	8	103

Table 4.81 Cross tab values for effect of ICTs integration to quality of teaching and learning.

69 respondents (67%) showed a strong correlation between integration of e-content in pedagogy and the improvement in the quality of teaching and learning. This effectively means that schools that have embraced ICT integration enjoy a better level of teaching and learning

e- learning resources has helped in reducing my workload* The design and format of the e-learning content facilitate student centric learning Cross tabulation							
Count							
		The design and format of the e-learning content facilitate student centric learning					
		1	2	3	4	5	Total
e- learning resources has helped in reducing my workload]	1	7	15	0	0	1	23
	2	4	35	10	5	2	56
	3	0	2	4	1	0	7
	4	2	7	2	1	2	14
	5	1	2	0	0	0	3
Total		14	61	16	7	5	103

Table 4.82 Cross tab values for effect of digit content format on students centric learning and teachers work load.

61 respondents (59%) showed a strong positive relation between the design and format of the e-learning content and reduction of teachers' workload through facilitating student centric learning.

I have been able to integrate e- learning resources into the teaching and learning process in my subject. * The infrastructure in my school supports access and use of e-learning material Cross tabulation

Count

		The infrastructure in my school supports access and use of e-learning material					Total
		1	2	3	4	5	
I have been able to	1	7	8	2	1	1	19
integrate e- learning	2	9	38	5	4	1	57
resources into the	3	0	1	4	0	0	5
teaching and	4	2	4	2	5	1	14
learning process in	5	2	1	1	1	3	8
my subject.							
Total		20	52	14	11	6	103

Table 4.83 Cross tab values for effect of infrastructural support and ICTs integration in pedagogy.

62 respondents (60%) showed that despite the presence of strong infrastructural support for ICTs in the school 9 respondents (8.7%) were not able to integrate e-learning in pedagogy. The research shows that despite 15% citing building of infrastructure as a solution to enhancing e-learning the existing resources are not fully utilized

CHAPTER FIVE

5.0 SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter covers summary of findings, discussion, conclusions and recommendations

5.2 Summary of main findings

This research intended to establish the effect of digital content utilization on teaching and learning in Kenyan secondary schools with e-learning. A cross sectional survey design was adopted and stratified random sampling technique used to arrive at the desired respondents. This will include the benefits accrued from access of these resources, challenges faced and the possible remedies at the institutional level (from users) to overcome these challenges.

5.3 Discussion of Results

The discussion that follows are guided by and focused on the research objectives that were set up in chapter one.

The following were the objectives of the study:

5.3.1 Investigate the level of digital content utilization in Kenyan secondary schools with e-learning.

The research has revealed that 79% of the target study agrees that digital content has been integrated into the teaching and learning process. There is evidence that most teachers do not use the digital content in the main streamed timetabled pedagogy which tallied at 8% but rather prefer to let student use it for self learning 36%. 31% use it for revision while 18% use it for revision. The education system is heavily exam oriented (MOE, 2012) and thus a lot of emphasis is placed on covering the syllabus through the conventional classroom teaching. For this reason the level of integration should be emphasized at this point to realize the maximum benefits of

digital content. The teachers' attitude plays a big role in the choice of how the e-content is used. Since most teachers mistakenly viewed the digital content as being shallow this titled the choice towards other resources. The teachers were interrogated for further information on this view and it was found that they based this view on relating the digital content to existing textbooks rather than the syllabus. Those who were asked to use the syllabus to gauge the same content where of the view that all the objectives and topics were well covered.

5.3.2 Find out how digital content utilization has affected teaching and learning in Kenyan secondary schools.

Integration of ICTs in pedagogy is a change that affects the way teachers are students relate with the curriculum. The research found out that adaptation of ICTs in pedagogy is undergoing through phases as depicted by Fullan (1982, 1991) who proposed that there are four broad phases in change process, the initiation, implementation, continuation and outcome. While the ESP programme ensured that most schools have gone through the initiation period, the implementation stage was left in the hands of the teachers and school administrators. This effectively made this group to be the agents of change and central in the study. It was clear that the need for ICT integration was understood and supported by all but the group reiterated the need for further support in terms of training on ICT skills and provision of ICT infrastructure. A good percentage (81%) of the teachers opined that Integration of ICTs is on in their institutions but a cross check with students revealed a disturbing picture. Whereas majority utilize digital content in curriculum implementation it's only a paltry 8% who use it in actually classroom teaching and learning. The rest have integrated digital content at the secondary level as a reference material or for student self learning. The students have more interaction with the digital content both in and out of the class and this has greatly enhanced their discovery skills. The adoption of ICTs in education takes time. Fullan (1992) correctly notes that integration happens in several stages name:

- The incidental and isolated use of ICT by one or more teachers;

- Increasing school awareness of ICT relevance for the school at all levels;
- Emphasis on ICT co-ordination and hardware within school;
- Emphasis on didactic innovation and ICT support; and
- Use of ICT-integrated teaching and learning that is independent of time and place.

Though the respondents were positive on the high integration of ICT in pedagogy; the research findings reveal that the Kenyan schools are still at the Emphasis on ICT co-ordination and hardware within school stage. Most respondents perceived availability of digital content as a measure of ICT integration. This would have been better represented by the number of contact hours in mainstream teaching and learning.

Perceptions also played a major role in the use of digital content. Most teachers were of the view that the digital content is shallow in coverage. This prompted a cross survey that targeted specific respondents. The respondents were unable to point out the shallow topics based on the syllabus and outlined specific objectives. As Fullan (1992) identified there is need for adoption of new activities, behaviors or practices; and a change in belief and understanding on e-learning.

5.4 Conclusion

The purpose of the study was to assess the impact of digital content utilization on teaching and learning in Kenyan secondary schools with e-learning. The research revealed that digital content enhanced learner's concentration and makes understanding of concepts easier. Use of digital content reduces the teachers work load thus making the teaching learning experience more efficient. The challenges faced in utilization of digital content include lack of skills, infrastructure and accesses to content. The research proposes mainstreaming of the digital content in the course work for maximum utilization through inclusion during timetabling.

5.5 Recommendations

From the research findings it is evident that digital content enhances the teaching and learning process. It's in this light that this research recommends that:

- MOE to initiate bottoms up approach where teachers and students are developing e-resources responsive to their immediate needs.
- KIE through PPP to initiate massive sensitization of teachers on digital content utilization.
- KIE to initiate a national repository for digital educational resources that all stakeholders can share and build on.
- MOE to spur locally developed open educational resources.

5.6 Suggestions for further research

There is need to research further on:

- Factors contributing to resistance to inclusion of digital content in the main stream course work in most Kenyan secondary schools.
- Use of textbooks as a benchmark for depth of digital content instead of the approved syllabus.

5.7 Limitations of the study

The study population covers the entire country and comprises many schools. It was very expensive and resource intensive to collect data. In the early months of the year all schools are busy preparing their work plans , admitting form ones this made communication by the administrators was difficult. The respondents were also wary of divulging too much information but this was managed through an assurance of confidentiality.

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7.0 Appendix

7.1 Request letter to the Principals/County directors/Field officers

Kanyi J Gioko,

Nairobi University,

P.O. Box 30231, 00100,

Nairobi.

Dear Sir/Madam

Re: Research Questionnaire

I am a Masters of Information student at University of Nairobi specializing in information systems.

My profession is to develop e-learning materials for basic education. My research project is using questionnaires to evaluate; *the effect of digital content utilization on teaching and learning in Kenyan secondary schools*. In order to gather data for the research some questionnaires will be filled by the teachers, students and the principal. I request for your assistance in this academic endeavor by allowing your teachers and students to fill the questionnaires, filling your questionnaire. All the data collected will be held in strict confidentiality.

Thank you for your co-operation.

Regards.

Kanyi Gioko

7.2 Letter of Authorization to Research.



UNIVERSITY OF NAIROBI
COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES
SCHOOL OF COMPUTING AND INFORMATICS

Telephone: 4447870/ 4444919/4446544
Telegrams: "Varsity" Nairobi
Email: director-sci@uonbi.ac.ke

P. O. Box 30197
00100 GPO
Nairobi, Kenya

Our Ref: UON/SCI/MSC(CS)/2010

15/2/2013

Kanyi J. Gioko
P56/60420/2011

TO WHOM IT MAY CONCERN

Dear Sirs/Madam

KANYI J. GIOKO – REG. NO. P56/60420/2011

The above named is a bona fide student pursuing a Master of Science in Information Systems degree at the School of Computing and Informatics, University of Nairobi. He is currently carrying out his research on the project entitled: **"The Effect of Digital Content Utilization on Teaching and Learning in Kenyan Secondary Schools."**

We would be grateful if you could assist Mr. Gioko as he gathers data for his research. If you have any queries about the exercise please do not hesitate to contact us. The information you provide will be solely for the project.

Yours faithfully

PROF. W. OKELO-ODONGO
DIRECTOR
SCHOOL OF COMPUTING AND INFORMATICS

WOO/jsn

UONBiosNew © My docuProject Research letter

7.3 Questionnaire one

STUDY ON DIGITAL CONTENT UTILIZATION IN TEACHING AND LEARNING (To be filled by the PRINCIPAL/ HEAD OF INSTITUTION)

- i. County: -----
- ii. District -----
- iii. Name of School -----
- iv. Subject(s); area of specialization -----
- v. Type of School: Private ☐ Public ☐
- vi. School setting: Urban ☐ Rural ☐
- vii. Sex: Male ☐ Female ☐
- viii. Your highest educational qualification (*tick below*)
- O-Level ☐ A-Level ☐ Diploma ☐ Degree ☐ Post graduate ☐
- ix. Your experience in years in the current post(*Tick below*)
- 0-5 ☐ 6-10 ☐ 11-15 ☐ 16 and above ☐
1. Do you use digital content in for teaching and learning in your school?
- Yes ☐ No ☐
2. Subject/module in which digital content is available in your school;
-
3. How did you acquire the digital content? Tick appropriate
- ESP ☐ Donation ☐ Internet ☐
- Developed ☐ Purchase ☐ Other ☐

4. How would you describe your initial access to the digital content/module?

Very difficult

Difficult

Easy

Very easy

Not sure

5. How would you describe the availability and access of the digital content?

Excellent

Requires slight improvement

Requires major improvement

Poor

Not Sure

6. In which curricula / co curricula areas did you find the digital content useful in the school programmes?

7. In which areas did you find the digital content useful in outside the school?

8. What else would you have liked to see included in the digital content?

9. Any further suggestions for improvement?

Thank you

Submit

7.4 Questionnaire two

TEACHERS EVALUATION SURVEY

BACKGROUND INFORMATION

- i. County: -----
- ii. District -----
- iii. Name of School -----
- iv. Subject(s); area of specialization -----
- v. Type of School: Private ☐ Public ☐
- vi. School setting: Urban ☐ Rural ☐
- vii. Sex: Male ☐ Female ☐
- viii. Your highest educational qualification (*tick below*)
- O-Level ☐ A-Level ☐ Diploma ☐ Degree ☐ Post graduate ☐
- ix. Your experience in years in the current post(*Tick below*)
- 0-5 ☐ 6-10 ☐ 11-15 ☐ 16 and above ☐

9. Content Access

Please indicate the level of your agreement or disagreement with the following statements about digital curriculum content access.

Statement	<i>Strongly Agree</i>	<i>Agree</i>	<i>Not Sure</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
	5	4	3	2	1
There is easy access to digital curriculum content within the school					
There is easy access to digital content outside school.					
The content is packaged in an easy to use format.					
The content has covered all areas of the curriculum in my subject.					
Digital materials to support curriculum are readily available and accessible.					
Digital Curriculum support materials are readily available in multiple formats. (CDs, DVDs, Audio cassettes,					

radio, VHS and web based access)					
I can navigate easily within the material					
My subject needs are met by the materials					
My teaching requirement are met by the material					

10. Content Utilization; Teacher oriented

<i>SA – Strongly Agree A - Agree NS- Not Sure D – Disagree SD- Strongly Disagree</i>					
Statement	SA	A	NS	D	SD
Digital content has been integrated into the teaching and learning process.					
Digital content enhances learners understanding of concepts					
Digital content can replace the role of teachers in a classroom					
Digital content has reduced teachers workload					
Digital content has improved the quality of classroom teaching and learning					
Digital content enhances learners concentration in class					
Digital content enhance delivery of content in teaching and learning.					

11. Administrative support

<i>SA – Strongly Agree A - Agree NS- Not Sure D – Disagree SD- Strongly Disagree</i>					
Statement	SA	A	NS	D	SD
As e-content user, I get adequate support on content availability.					
I get enough training and exposure on how to utilize e-content.					
The field officers provide information on available e-content.					

12.

Utilization	Strongly Agree	Agree	Disagree	Strongly Disagree	Strongly Agree
The manuals give me the information I needed to learn about and prepare for the digital content.					
The e-learning materials provided were useful in integrating in classroom teaching.					
The design and format of the e-learning content facilitate student centric learning.					
The infrastructure in my school supports access and use of e-learning material.					
The digital content uses tools that are easy to understand and utilize in class.					

13. Effects of E-learning Programme

Rate the following statements related to e-learning based on the given scale.

<i>SA – Strongly Agree A - Agree NS- Not Sure D – Disagree SD- Strongly Disagree</i>					
Statement	SA	A	NS	D	SD
I have been able to integrate e- learning resources into the teaching and learning process in my subject.					
Digital content have enhanced my understanding of concepts in my subject.					
I feel that digital content can almost replace the role of a teacher in a classroom					
I feel e-learning has improved the quality of classroom teaching and learning.					

14.

- a) What challenges did you face when using e-content?

- b) How did you handle the challenges of using e-content?

- c) Kindly mention one thing that made you **comfortable** when engaging with the e-content.

- d) Mention one thing that made you **uncomfortable** when engaged with the e-content.

e) In your opinion, what should be done to improve the digital content?

End. Thank you Please e-mail back/submit the filled questionnaire.

7.5 Questionnaire Three

- i. County
- ii. School
- iii. Class/Form.....

15. Which of these do you use regularly? (Put a tick on all that apply)

- i. Word processor
- ii. Email
- iii. Web searches
- iv. Online discussions
- v. Online chats
- vi. None of these

16. Which of these tools have you ever used? (Choose all that apply)

- i. Blogs
- ii. Wikis
- iii. Instant messaging
- iv. Voice over internet protocol (e.g. Skype)
- v. Social media(e.g. facebook, twitter and you tube)
- vi. None of these

17. How do you access the Internet? (Choose all that apply)

- i. Dial-up connection/LAN
- ii. Broadband connection (Modem)
- iii. Internet café
- iv. Cell phone
- v. Hot spots/Wireless connection
- vi. None

18. Do you have any experiences of using digital content?

- i. no previous experience
- ii. Has experience

19. What are your experiences of using digital content?

- i. Used it in class.
- ii. Used at home for entertainment
- iii. Other

20. What ways do you use digital content in the classroom activities?

Learning
Reference
Revision
Course material
Collaboration

21. Which areas of the syllabus would you prefer to have digital content on? Give reasons for each.

Area	Reason

22. Suggest areas of improvement to make the content more useful to understanding content?
(Please write a few sentences)

--

Thank you for completing this questionnaire

Submit

7.6 List of ESP schools

Table 7.1 List of ESP schools

LIST OF ESP-ICT FUNDED SCHOOLS (2010-2011)			
SNO	Province	Constituency	Name of School
1.	Nyanza	Alego Usonga	Hawinga Girls Secondary School
2.	Nyanza	Alego Usonga	Hono Secondary School
3.	Nyanza	Alego Usonga	Obambo Secondary School
4.	Nyanza	Alego Usonga	Nyambare Secondary School
5.	Nyanza	Alego Usonga	Mwer Secondary School
6.	Western	Amagoro	St. Charles Lwanga Otimong
7.	Western	Amagoro	St. Monica Chakol Girls Sec.
8.	Western	Amagoro	Fr. Okodoi Secondary Schl.
9.	Western	Amagoro	Moding Secondary
10.	Western	Amagoro	St. Thomas Amagoro Girls
11.	Rift Valley	Baringo Central	Ngambo Secondary School
12.	Rift Valley	Baringo East	Chemolingot Secondary
13.	Rift Valley	Baringo East	AIC Churo Secondary
14.	Rift Valley	Belgut	Koiwalelach Girls' Secondary school
15.	Rift Valley	Belgut	St. Thomas Mindiliwet Secondary Sch.
16.	Rift Valley	Belgut	Kapcheluch Secondary Sch.
17.	Rift Valley	Belgut	Borborwet Mixed Day Secondary Sch.
18.	Rift Valley	Belgut	Musaria Secondary Sch.
19.	Nyanza	Bobasi	Naikuru Mixed Secondary School
20.	Nyanza	Bobasi	Gionseri Girls Secondary School
21.	Nyanza	Bobasi	Nyachogochogo Mixed Secondary School
22.	Nyanza	Bobasi	Nyamagwa Secondary School

23.	Nyanza	Bobasi	Nyabonge Secondary School
24.	Nyanza	Bomachoge	Nyamonyo Mixed
25.	Nyanza	Bomachoge	Sengera Parish
26.	Nyanza	Bomachoge	Omobera Girls
27.	Nyanza	Bomachoge	Nyakoiba Mixed
28.	Rift Valley	Bomet	Kabungut Boys Secondary
29.	Rift Valley	Bomet	Chebonei Girls
30.	Rift Valley	Bomet	Kaporuso Mixed
31.	Rift Valley	Bomet	Longisa Boys
32.	Rift Valley	Bomet	St. Catherine Girls
33.	Nyanza	Bondo	Usenge High School
34.	Nyanza	Bondo	Barchando Girls Secondary
35.	Nyanza	Bondo	Gobei Mixed Secondary
36.	Nyanza	Bondo	Akoko Mixed Secondary
37.	Nyanza	Bondo	Majengo Mixed Secondary
38.	Western	Budalangi	St. benedict High School Bundalangi
39.	Western	Budalangi	John Osogo Secondary School
40.	Western	Budalangi	St. Cecilia Namenya Girls' Secondary School
41.	Western	Budalangi	Makunda Secondary School
42.	Western	Budalangi	Osieko Secondary School
43.	Western	Bumula	Mungore Girls Secondary School
44.	Western	Bumula	Netima Secondary School
45.	Western	Bumula	Bumula Secondary School
46.	Western	Bumula	Mwiruti Secondary School
47.	Western	Bumula	Kimaeti Secondary School
48.	Coast	Bura	Madogo Secondary School
49.	Coast	Bura	Hirimani secondary School
50.	Western	Butula	Bumala AC Secondary School
51.	Western	Butula	Busiada Girls Secondary School

52.	Western	Butula	Buhuyi Secondary School
53.	Eastern	Central Imenti	Keeru Boys Secondary School
54.	Coast	Changamwe	Kajembe Secondary School
55.	Coast	Changamwe	Tudor Secondary School
56.	Coast	Changamwe	Miritini Secondary School
57.	Coast	Changamwe	St. Charles Lwanga Secondary School
58.	Coast	Changamwe	Changamwe Secondary School
59.	Nairobi	Dagoretti	Mutuini High School
60.	Nairobi	Dagoretti	Dagoretti Mixed Secondary School
61.	Nairobi	Dagoretti	Ruthimitu Mixed Secondary School
62.	Nairobi	Dagoretti	Ruthimitu Girls Secondary School
63.	Nairobi	Dagoretti	Dagoretti High School
64.	North Eastern	Dujis	Boystown Secondary
65.	North Eastern	Dujis	Tetu Secondary
66.	North Eastern	Dujis	Umu-Salama Girls
67.	North Eastern	Dujis	Iftin Girls Secondary School
68.	Rift Valley	Eldoret South	Ngeria Girls Secondary School
69.	Rift Valley	Eldoret South	Wareng High School
70.	Rift Valley	Eldoret South	Cheptiret Secondary School
71.	Rift Valley	Eldoret South	Bishop Muge Subukia Secondary School
72.	Rift Valley	Eldoret South	Moi Avenue Secondary School
73.	Nairobi	Embakasi	Mwangaza Secondary School
74.	Nairobi	Embakasi	Kayole South Secondary School
75.	Nairobi	Embakasi	Dandora Secondary
76.	Rift Valley	Emgwen	Fr. Kuhn Chepsonoi Mixed Secondary Sch.
77.	Rift Valley	Emgwen	Martin Lel Kimngeru Mixed Secondary Sch.
78.	Rift Valley	Emgwen	Kabirirsang Mixed Secondary Sch.
79.	Rift Valley	Emgwen	Kosirai High School
80.	Western	Emuhaya	Bunyore Girls

81.	Western	Emuhaya	Kilingili Secondary
82.	Western	Emuhaya	Ebubayi Secondary
83.	Western	Emuhaya	Ekwanda Secondary
84.	Western	Emuhaya	Esibila Secondary
85.	Eastern	Gachoka	Kiambere Secondary School
86.	Coast	Garsen	Marifano Secondary School
87.	Central	Gatanga	St. Paul Gatura Secondary school
88.	Central	Gatanga	Kihumbuini Secondary school
89.	Central	Gatanga	Mbugiti Secondary school
90.	Central	Gatanga	Kirwara Secondary school
91.	Central	Gatanga	Ithanga Secondary school
92.	Central	Gatundu North	Our Lady of Fatima Kiriko Girls
93.	Central	Gatundu North	Nyamang'ara Secondary School
94.	Central	Gatundu North	St. Francis Girls High School Mangu
95.	Central	Gatundu North	Gacege Secondary School
96.	Central	Gatundu North	Makwa Secondary School
97.	Central	Gatundu South	Kimunyu Secondary School
98.	Central	Gatundu South	Gachika Secondary School
99.	Central	Gatundu South	Gatitu Secondary School
100.	Central	Gatundu South	Mururia Secondary School
101.	Central	Gatundu South	Muhoho Secondary School
102.	Nyanza	Gem	Nyagondo Mixed Secondary School
103.	Nyanza	Gem	Sirembe Mixed Secondary School
104.	Nyanza	Gem	Kambare Mixed Secondary School
105.	Nyanza	Gem	Mutumbu Girls Secondary School
106.	Central	Gichugu	Kiamugumo Girls Secondary
107.	Nyanza	Gwasssi	St. Antony Nyandiwa

			Secondary School
108.	Nyanza	Gwasssi	Gingo Secondary School
109.	Nyanza	Gwasssi	Nyagwethe Secondary School
110.	Nyanza	Gwasssi	St. Gabriel Gwasssi Secondary School
111.	North Eastern	Ijara	Shurie Secondary School
112.	North Eastern	Ijara	Yussuf Haji Girls' Secondary
113.	Eastern	Isiolo North	Isiolo Boys Secondary School
114.	Eastern	Isiolo North	St. Pauls Kiwanjani Secondary School
115.	Eastern	Isiolo North	Oldonyiro Secondary School
116.	Eastern	Isiolo North	Merti Boys Secondary School
117.	Eastern	Isiolo North	Merti Muslim Girls Secondary School
118.	Central	Juja	Munyu Girls Secondary School
119.	Central	Juja	Ruiru Girls Secondary School
120.	Central	Juja	Kitamaiyu Secondary School
121.	Eastern	Kaiti	Kilungu high School
122.	Eastern	Kaiti	St. Lucia Kauti Girls Secondary School
123.	Eastern	Kaiti	Ndolo Secondary School
124.	Rift Valley	Kajiado North	Olturoto Secondary
125.	Rift Valley	Kajiado North	Oloyiankalani Secondary
126.	Rift Valley	Kajiado North	Olekasasis Secondary
127.	Rift Valley	Kajiado North	Olooseos Girls
128.	Rift Valley	Loitokitok	Illasit Secondary
129.	Rift Valley	Loitokitok	Oloitokitok Boys Secondary
130.	Rift Valley	Loitokitok	Rombo Girls Secondary
131.	Rift Valley	Loitokitok	Colin Davies Secondary
132.	Rift Valley	Loitokitok	Kikelelwa Secondary
133.	Nairobi	Kamukunji	Maina Wanjigi Secondary School
134.	Nairobi	Kamukunji	Uhuru Secondary School
135.	Nairobi	Kamukunji	Eastleigh Secondary

			School
136.	Nairobi	Kamukunji	Kamukunji Secondary School
137.	Central	Kandara	Ng'araria Girls Secondary School
138.	Central	Kandara	Mung'aria Secondary School
139.	Central	Kandara	Kandara Boys Secondary School
140.	Central	Kandara	Ngurweini Secondary School
141.	Central	Kandara	Githunguri Mixed Secondary School
142.	Western	Kanduyi	St. Mary's Kibabii Secondary School
143.	Western	Kanduyi	Namachanja Secondary School
144.	Western	Kanduyi	St. Martin's Mwibale Secondary School
145.	Western	Kanduyi	Misanga FYM Secondary School
146.	Western	Kanduyi	Musikoma Secondary School
147.	Central	Kangema	Rwathia Mixed Secondary
148.	Central	Kangema	Kiruri Secondary
149.	Central	Kangema	Nyakahura Secondary
150.	Central	Kangema	Watuha Secondary
151.	Central	Kangema	Dr. Kiano (Githiga) Secondary
152.	Nyanza	Karachuonyo	St Francis Nyangajo Girls Secondary School
153.	Nyanza	Karachuonyo	Kobala Boys Secondary School
154.	Nyanza	Karachuonyo	Oriwo Boys Secondary School
155.	Nyanza	Karachuonyo	Karabondi Bidii Mixed Secondary School
156.	Nyanza	Karachuonyo	Samanga Lutheran Secondary School
157.	Nairobi	Kasarani	Baba Ndogo Secondary School
158.	Nairobi	Kasarani	Kahawa Garrison Secondary School
159.	Nairobi	Kasarani	Our Lady of Fatima
160.	Nairobi	Kasarani	Kamiti Secondary School
161.	Nairobi	Kasarani	Kariobangi North Girls Secondary School

162.	Nyanza	Kasipul Kabondo	Dudi Girls Secondary school
163.	Nyanza	Kasipul Kabondo	Othoro Mixed Secondary school
164.	Nyanza	Kasipul Kabondo	Wangapala Boys Secondary School
165.	Nyanza	Kasipul Kabondo	Nyangiela Secondary School
166.	Eastern	Kathiani	Kaani Secondary School
167.	Eastern	Kathiani	Mitaboni ABC Girls
168.	Eastern	Kathiani	General Mulinge Secondary School
169.	Western	Khwisero	Khwisero Girls Secondary school
170.	Western	Khwisero	Emalindi Girls Secondary school
171.	Western	Khwisero	Ekambuli Secondary school
172.	Western	Khwisero	Luanda Dudi Secondary school
173.	Western	Khwisero	Khwisero Mixed Secondary school
174.	Central	Kiambaa	Wangunyu Girls Secondary School
175.	Central	Kiambaa	Riara Secondary School
176.	Central	Kiambaa	Gachie Secondary School
177.	Central	Kiambaa	Muongoiya Secondary School
178.	Central	Kiambaa	Ting'ang'a Secondary School
179.	Eastern	Kibwezi	Kisayani Secondary
180.	Eastern	Kibwezi	Utithi Secondary
181.	Eastern	Kibwezi	Muthinginiini Secondary
182.	Eastern	Kibwezi	Nguumo Secondary
183.	Eastern	Kibwezi	Makindu High
184.	Central	Kieni	Mweiga High School
185.	Central	Kieni	Watuka Secondary School
186.	Central	Kieni	Mugunda Secondary School
187.	Central	Kieni	Karundas Secondary School
188.	Central	Kieni	Burguret Secondary School
189.	Central	Kiharu	Kiambuigi Secondary School

190.	Central	Kiharu	Gaturi Girls Secondary School
191.	Central	Kiharu	Koimbi Boys Secondary School
192.	Central	Kiharu	Gitura Secondary School
193.	Central	Kiharu	Kagumo Secondary School
194.	Central	Kikuyu	Rungiri Secondary School
195.	Central	Kikuyu	Kibichiku Secondary School
196.	Central	Kikuyu	Kahuho Uhuru Secondary School
197.	Central	Kikuyu	Karai Mixed Secondary School
198.	Central	Kikuyu	Kabete High School
199.	Rift Valley	Kilgoris	Emurua Secondary School
200.	Rift Valley	Kilgoris	Ndamana Secondary School
201.	Rift Valley	Kilgoris	Enoosaen Girls Secondary School
202.	Rift Valley	Kilgoris	Shartuka Secondary School
203.	Rift Valley	Kilgoris	Siria High School
204.	Eastern	Kilome	ABC Kayata Girls secondary School
205.	Eastern	Kilome	Kilome S. A. Secondary School
206.	Eastern	Kilome	Mulumini Secondary School
207.	Eastern	Kilome	Kwakiketi Secondary School
208.	Eastern	Kilome	Kasikeu Girls Secondary School
209.	Western	Kimilili	Kimilili friends Girls Secondary
210.	Western	Kimilili	St. James Mapale Secondary
211.	Western	Kimilili	Bishop Phillip Anyolo
212.	Western	Kimilili	Mitua Girls
213.	Central	Kinangop	Ndunyu- Njeru
214.	Central	Kinangop	Kimuri Secondary School
215.	Central	Kinangop	Muruaki Secondary School
216.	Central	Kinangop	Bongo Girls' Secondary School

217.	Central	Kinangop	Munyaka Secondary School
218.	Central	Kipipiri	Geta Secondary
219.	Central	Kipipiri	Kiambogo Sec.
220.	Central	Kipipiri	Wanjohi Mixed Sec.
221.	Central	Kipipiri	Ndemi Sec.
222.	Central	Kipipiri	Mumui Sec.
223.	Central	Kirinyaga Central	Mutitu Mixed Day Secondary
224.	Central	Kirinyaga Central	Gatwe Mixed Day Secondary
225.	Central	Kirinyaga Central	St. Johns Thaita day Secondary
226.	Central	Kirinyaga Central	Gakoigo Mixed Day secondary
227.	Nyanza	Kisumu Rural	St. Barnabas Girls Secondary School
228.	Nyanza	Kisumu Rural	Ngere Boys' Secondary School
229.	Nyanza	Kisumu Rural	Chulaimbo Boys' Secondary School
230.	Nyanza	Kisumu Rural	Sinyolo Girls Secondary School
231.	Nyanza	Kisumu Rural	Ratta mixed Secondary School
232.	Nyanza	Kisumu Town East	Kassagam Mixed Secondary School
233.	Nyanza	Kisumu Town East	St. Ignatius Loyola Magadi
234.	Nyanza	Kisumu Town East	Okok Mixed Secondary School
235.	Nyanza	Kisumu Town East	Dr. Aloo Gumbi Secondary School
236.	Nyanza	Kisumu Town East	Obwolo Secondary School
237.	Nyanza	Kisumu Town West	Bishop Okoth Ojolla Girls Secondary School
238.	Nyanza	Kisumu Town West	St. Anthony Dago Kokore Secondary School
239.	Nyanza	Kisumu Town West	Kanyamedha Secondary School
240.	Nyanza	Kisumu Town West	Wachara Secondary School
241.	Nyanza	Kisumu Town West	Ongalo Secondary School
242.	Eastern	Kitui Central	Mosa Secondary School
243.	Eastern	Kitui Central	Ivaini Secondary

			School
244.	Eastern	Kitui Central	Mulutu Girls Secondary School
245.	Eastern	Kitui Central	Yumbisye Secondary School
246.	Eastern	Kitui west	Muthale Girls Secondary School
247.	Eastern	Kitui west	Kyondoni Girls Secondary School
248.	Eastern	Kitui west	Katheka Boys Secondary School
249.	Eastern	Kitui west	Kyaani Secondary School
250.	Eastern	Kitui west	Kyangi Secondary School
251.	Nyanza	Kitutu Chache	Nyansore Secondary School
252.	Nyanza	Kitutu Chache	Rioma Secondary School
253.	Nyanza	Kitutu Chache	Nyagesenda Secondary School
254.	Nyanza	Kitutu Chache	Kioge Girls Secondary School
255.	Nyanza	Kitutu Chache	Getembe Secondary School
256.	Nyanza	Kitutu Masaba	Rigoma Secondary School
257.	Nyanza	Kitutu Masaba	Kebirichi Secondary School
258.	Nyanza	Kitutu Masaba	Nyakongo Secondary School
259.	Nyanza	Kitutu Masaba	Tombe Girls Secondary School
260.	Nyanza	Kitutu Masaba	Nyambaria High School
261.	Rift Valley	Konoin	St. Monica Girls Secondary School
262.	Rift Valley	Konoin	Koiwa High School
263.	Rift Valley	Konoin	Sotit Secondary School
264.	Rift Valley	Konoin	Kipkorir Salat Secondary School
265.	Rift Valley	Konoin	Boito Secondary School
266.	Rift Valley	Kuresoi	Cheptuech Secondary School
267.	Rift Valley	Kuresoi	ELCK Kongoi Secondary School
268.	Rift Valley	Kuresoi	Keringet Secondary School

269.	Rift Valley	Kuresoi	Mau Summit Secondary School
270.	Rift Valley	Kuresoi	Sitoito Secondary School
271.	Nyanza	Kuria	Matare Boys Secondary School
272.	Nyanza	Kuria	St Peter's Kegonga Secondary School
273.	Nyanza	Kuria	Ikerege Mixed Secondary School
274.	Nyanza	Kuria	St. Mary's Mabera Girls Secondary School
275.	Rift Valley	Kwanza	St. Barnabas Sabwani
276.	Rift Valley	Kwanza	Kimwondo
277.	Rift Valley	Kwanza	Kwanza Friends
278.	Rift Valley	Kwanza	Bishop Muge
279.	Rift Valley	Kwanza	Kobos Secondary
280.	Nairobi	Langata	Langata Secondary School
281.	Nairobi	Langata	Olympic Secondary School
282.	Nairobi	Langata	Langata Barracks Secondary School
283.	Nairobi	Langata	Raila Education Centre
284.	Nairobi	Langata	Karen C Secondary School
285.	Coast	Likoni	Likoni Secondary School
286.	Coast	Likoni	Moi forces Secondary
287.	Coast	Likoni	Mtongwe Girls Secondary
288.	Coast	Likoni	Shika Adabu Secondary
289.	Coast	Likoni	Puma Secondary School
290.	Central	Limuru	Tigoni Secondary School
291.	Central	Limuru	Kinyogori Secondary School
292.	Central	Limuru	Makutano Secondary School
293.	Central	Limuru	Rironi Secondary School
294.	Central	Limuru	Ndungu Njenga Secondary School
295.	Western	Lugari	St. Anne's Nzoia Girls Secondary School
296.	Western	Lugari	Friends School Kongoni
297.	Western	Lugari	Kivaiywa Boys High

			School
298.	Eastern	Machakos	Muindi Mbingu Secondary School
299.	Eastern	Machakos	Muvuti Secondary School
300.	Eastern	Machakos	Mumbuni Girls Secondary School
301.	Eastern	Machakos	Mbuani Secondary School
302.	Eastern	Machakos	Kyangala High School
303.	Coast	Magarini	Marafa Secondary School
304.	Coast	Magarini	Magarini Secondary School
305.	Coast	Magarini	Mapimo Girls Secondary School
306.	Nairobi	Makandara	Buruburu Girls Secondary School
307.	Nairobi	Makandara	Ofafa Jericho Secondary School
308.	Nairobi	Makandara	Nile Road Secondary School
309.	Nairobi	Makandara	Makongeni Mixed Secondary School
310.	Eastern	Makueni	Kathonzweni Boys
311.	Coast	Malindi	Canon Mweri Memorial Secondary School
312.	Coast	Malindi	Barani Secondary School
313.	Coast	Malindi	Kibokoni Secondary School
314.	Coast	Malindi	Kakoeni Girls Secondary School
315.	Coast	Malindi	Jirore High school
316.	North Eastern	Mandera East	Arabia Girls Secondary School
317.	North Eastern	Mandera East	Lafey Boys Secondary School
318.	North Eastern	Mandera East	Arabia Boys Secondary School
319.	Eastern	Manyatta	Nguvu Boys Secondary School
320.	Eastern	Manyatta	Kirigi Day Secondary School
321.	Eastern	Manyatta	St. Theresa's Girls Secondary School
322.	Eastern	Manyatta	Kirimari Secondary School

323.	Eastern	Manyatta	Kangaru Girls High school
324.	Rift Valley	Marakwet West	Santa Maria Cheptulon
325.	Rift Valley	Marakwet West	Chebiemit Boys
326.	Rift Valley	Marakwet West	Kapsowar Boys
327.	Rift Valley	Marakwet West	Moi Kapcherop Girls
328.	Central	Mathira	Kanjuri Boys High School
329.	Central	Mathira	Gatondo Girls
330.	Central	Mathira	Kangocho Mixed Day
331.	Central	Mathira	Ngunguru Secondary
332.	Central	Mathira	Kianjogu Secondary
333.	Coast	Matuga	Waa Girls Secondary School
334.	Coast	Matuga	Ng'ombeni Secondary School
335.	Coast	Matuga	Golini Secondary School
336.	Coast	Matuga	Mwaluphamba Secondary School
337.	Western	Matungu	St. Mathias Kholera Secondary school
338.	Western	Matungu	St. Gabriel Mirere Secondary school
339.	Western	Matungu	Munami Secondary school
340.	Western	Matungu	Namulungu Secondary school
341.	Western	Matungu	St. Charles Lunga'anyiro Secondary school
342.	Nyanza	Mbita	Ogongo Mixed Day Secondary School
343.	Nyanza	Mbita	Waondo Secondary School
344.	Nyanza	Mbita	Tom Mboya Secondary School
345.	Eastern	Mbooni	Utangwa Secondary School
346.	Eastern	Mbooni	Kyuu Secondary School
347.	Rift Valley	Mogotio	Mogotio Girls' High School
348.	Rift Valley	Mogotio	Kiptoim Mixed Secondary School

349.	Rift Valley	Mogotio	Maji Moto Mixed Secondary School
350.	Rift Valley	Mogotio	Cheberen Day Secondary School
351.	Rift Valley	Mogotio	Emining Boys Secondary School
352.	Rift Valley	Molo	Michinda Boys Secondary School
353.	Rift Valley	Molo	Kambala Girls Secondary School
354.	Rift Valley	Molo	Taita mauche Secondary School
355.	Rift Valley	Molo	Lare Vision Secondary School
356.	Rift Valley	Molo	Mau Narok Secondary School
357.	Eastern	Moyale	Moyale Girls Secondary School
358.	Western	Mt. Elgon	Toroso SA Secondary
359.	Western	Mt. Elgon	Kapkateny Secondary
360.	Western	Mt. Elgon	Kapsokwony Secondary
361.	Western	Mt. Elgon	Kibuk Girls
362.	Western	Mt. Elgon	Chemoge Secondary
363.	Nyanza	Muhoroni	St. Augustine Kandege Secondary School
364.	Nyanza	Muhoroni	St. Stephen Menara Secondary School
365.	Nyanza	Muhoroni	St. Benedict's Nyangoma Secondary School
366.	Nyanza	Muhoroni	Ombeyi Secondary School
367.	Central	Mukurwe-ini	Kaheti Boys Secondary School
368.	Central	Mukurwe-ini	Gikondi Secondary School
369.	Central	Mukurwe-ini	Mihuti Secondary School
370.	Central	Mukurwe-ini	ACK Kiuu Secondary School
371.	Central	Mukurwe-ini	Gathungururu Girls Secondary School
372.	Coast	Mvita	Sheikh Abdalla Alfarsy
373.	Coast	Mvita	Shariff Nassir
374.	Coast	Mvita	Tononoka Boys
375.	Coast	Mvita	Mvita Boys
376.	Eastern	Mwala	Kunikila Secondary School

377.	Eastern	Mwala	Mulu Secondary School
378.	Eastern	Mwala	Mango Secondary School
379.	Eastern	Mwala	Ikalaasa Secondary School
380.	Eastern	Mwala	Mbaani Secondary School
381.	Coast	Mwatate	Mwambonu Secondary mixed Day/Boarding
382.	Central	Mwea	Karoti Girls Secondary School
383.	Central	Mwea	Thiba Secondary School
384.	Central	Mwea	Mutithi Secondary School
385.	Central	Mwea	Murinduko Mixed Secondary School
386.	Central	Mwea	Nyangati Secondary School
387.	Eastern Eastern Eastern	Mwingi South	Nzeluni Girls Secondary School
388.		Mwingi South	Nguutani Secondary School
389.		Mwingi South	Kyamboo Secondary School
390.	Western	Nambale	Nasira Mixed Secondary School
391.	Western	Nambale	Murende Mixed Secondary School
392.	Western	Nambale	Lwanya Girls Secondary School
393.	Rift Valley	Narok North	Olpusimoru Secondary school
394.	Rift Valley	Narok North	Olorropil Secondary school
395.	Rift Valley	Narok North	Olasiti Secondary school
396.	Rift Valley	Narok North	St. Anthony's Secondary school
397.	Rift Valley	Narok North	Kisiriri Secondary school
398.	Central	Ndaragwa	Shamata Girls Secondary School
399.	Central	Ndaragwa	Ndaragwa Secondary School
400.	Central	Ndaragwa	Leshau Boys Secondary School
401.	Central	Ndaragwa	Mirichu Secondary School

402.	Central	Ndaragwa	Ngaindeithia Secondary School
403.	Central	Ndia	Ngugui-ni Secondary School
404.	Central	Ndia	Kiine Mixed Secondary School
405.	Central	Ndia	Kiburu Boys Secondary School
406.	Central	Ndia	Kianjege Secondary School
407.	Central	Ndia	Gathambi Secondary School
408.	Eastern	Nithi	Chuka Girls Secondary School
409.	Eastern	Nithi	Kajuki Secondary School
410.	Eastern	Nithi	Kiini Mixed Secondary School
411.	Eastern	Nithi	Ngeru Boys Secondary School
412.	Eastern	Nithi	Iruma Girls Secondary School
413.	Eastern	North Imenti	Kirige Boys
414.	Eastern	North Imenti	Munithu Girls
415.	Eastern	North Imenti	Nthimbiri mixed
416.	Eastern	North Imenti	Ruiri Secondary School
417.	Eastern	North Imenti	Ontulili Boys Seconary
418.	Eastern	Igembe North	Mutuati Secondary School
419.	Eastern	Igembe North	Thitha Secondary
420.	Eastern	Igembe North	Antubetwe Kiongo Secondary
421.	Eastern	Igembe North	Mariri Secondary School
422.	Eastern	Igembe North	Kithetu Secondary
423.	Nyanza	Nyando	Ahero Girls Secondary
424.	Nyanza	Nyaribari Masaba	Ibacho High School
425.	Nyanza	Nyaribari Masaba	Mosisa Secondary School
426.	Nyanza	Nyaribari Masaba	Chibwobi Secondary School
427.	Nyanza	Nyaribari Masaba	Mobamba Secondary School
428.	Nyanza	Nyaribari Masaba	St. Charles Lwanga Ichuni Girls Secondary School
429.	Nyanza	Nyatike	St. Gemma Girls
430.	Nyanza	Nyatike	Moi Nyatike Boys
431.	Nyanza	Nyatike	Bande Girls
432.	Nyanza	Nyatike	B.L. Tezza Complex

433.	Nyanza	Nyatike	Sori Boys
434.	Central	Nyeri Town	Riamukurwe Secondary School
435.	Central	Nyeri Town	Marua Mixed Secondary School
436.	Central	Nyeri Town	Kahiga Mixed Secondary School
437.	Central	Nyeri Town	Muthua-ini Girls Secondary School
438.	Central	Nyeri Town	Gachika Mixed Day Secondary School
439.	Central	Oi Kalou	Ngorika Secondary School
440.	Central	Oi Kalou	Manyatta Mixed day Secondary School
441.	Central	Oi Kalou	Salient Secondary School
442.	Central	Othaya	Kagonye Secondary School
443.	Central	Othaya	Kenyatta High School Mahiga
444.	Central	Othaya	Chinga Girls High School
445.	Central	Othaya	Karima Boys Secondary School
446.	Central	Othaya	Ihuririo Secondary School
447.	Nyanza	Rangwe	Lala Mixed Secondary School
448.	Nyanza	Rangwe	Wiobiero Secondary School
449.	Nyanza	Rangwe	Wikoteng Secondary School
450.	Nyanza	Rangwe	Luora Secondary School
451.	Nyanza	Rangwe	Kuoyo Kochia Boys Secondary School
452.	Rift Valley	Rongai	Bomasan Secondary School
453.	Rift Valley	Rongai	AIC Morop Girls Secondary School
454.	Rift Valley	Rongai	Mema Secondary School
455.	Rift Valley	Rongai	Mawe Secondary School
456.	Rift Valley	Rongai	Akuisi Secondary School
457.	Eastern	Runyenjes	DEB Gichieche Girls
458.	Eastern	Runyenjes	Kanja Secondary

459.	Eastern	Runyenjes	St. Getrude Kinthithe
460.	Eastern	Runyenjes	St. Barnabas Kathari
461.	Eastern	Runyenjes	St. John's Kianjuki
462.	Rift Valley	Saboti	St. Josephs Boys
463.	Rift Valley	Saboti	Kitale School Girls
464.	Rift Valley	Saboti	St. Brigids Girls
465.	Rift Valley	Saboti	St. Theresah's Sikhendu
466.	Eastern	Saku	Marsabit Boys Secondary School
467.	Eastern	Saku	Sasura Girls Secondary School
468.	Rift Valley	Samburu West	Maralal High School
469.	Rift Valley	Samburu West	Nyiro Boys Secondary –
470.	Rift Valley	Samburu West	Baragoi Girls
471.	Western	Shinyalu	Lunyu Secondary School
472.	Western	Shinyalu	Lwanda Secondary School
473.	Western	Shinyalu	Lugala Secondary School
474.	Eastern	Siakago	St. Antony Siakago Mixed Day Sec. Sch
475.	Eastern	Siakago	Kamarandi Secondary School
476.	Eastern	Siakago	St. Rita Mixed Day- Ngunyumu
477.	Eastern	Siakago	ACK Gitii Secondary school
478.	Eastern	Siakago	Kiambere School Complex
479.	Western	Sirisia	A.C. Butonge Secondary School
480.	Western	Sirisia	Toloso Mixed Secondary School
481.	Nyanza	South Mugirango	Riosiri Secondary School
482.	Nyanza	South Mugirango	St. Josephs Nyabigena Secondary School
483.	Nyanza	South Mugirango	Tabaka Township Secondary School
484.	Nyanza	South Mugirango	Mariwa Secondary School
485.	Nyanza	South Mugirango	Riagumo Secondary School
486.	Nairobi	Starehe	Muranga Road Boys Secondary
487.	Nairobi	Starehe	C.G.H.U. Mixed Day Secondary

488.	Nairobi	Starehe	St. Teresas Girls Day Sec.
489.	Nairobi	Starehe	Pumwani Boys Secondary
490.	Rift Valley	Subukia	Bavuni Secondary
491.	Rift Valley	Subukia	Bahati Girls Secondary school
492.	Rift Valley	Subukia	St joseph kirima
493.	Rift Valley	Subukia	Subukia Day Secondary school
494.	Rift Valley	Subukia	Magomano Secondary School
495.	Coast	Wundanyi	Canon Kituri Secondary School
496.	Coast	Wundanyi	Mwakiwiwi Secondary School
497.	Coast	Wundanyi	Kitumbi High School
498.	Coast	Wundanyi	Mghalu Secondary School
499.	Coast	Wundanyi	Mwangeka Secondary School
500.	Central	Tetu	Gititu Day mixed Secondary School
501.	Central	Tetu	Kaigonde Secondary School
502.	Central	Tetu	Mathakwa-ini Secondary School
503.	Central	Tetu	Wamagana Girls Secondary School
504.	Central	Tetu	Kiriti Secondary School
505.	Eastern	Tharaka	Matiri Boys
506.	Eastern	Tharaka	Nkondi Girls
507.	Eastern	Tharaka	Marimanti Girls
508.	Eastern	Tigania East	St. Angela's Nguthiru Girls
509.	Eastern	Tigania East	Karama Boys
510.	Eastern	Tigania East	Rware Girls
511.	Eastern	Tigania East	Kaliene
512.	Eastern	Tigania East	Akaiga
513.	Rift Valley	Tinderet	Sochoi A.I.C. Girls
514.	Rift Valley	Tinderet	Taito KTGA Secondary
515.	Rift Valley	Tinderet	Kaplelmet Secondary
516.	Nyanza	Ugenya	Anyiko Secondary School
517.	Nyanza	Ugenya	Ndenga Secondary School
518.	Nyanza	Ugenya	Yenga Secondary School

519.	Nyanza	Ugenya	Madungu Secondary School
520.	Nyanza	Ugenya	Umina Mixed Secondary School
521.	Western	Vihiga	Madira Girls Secondary School
522.	Western	Vihiga	Chavavo Secondary School
523.	Western	Vihiga	Kidinye Secondary School
524.	Western	Vihiga	Masana Secondary School
525.	Western	Vihiga	Mbihi Secondary School
526.	Coast	Voi	Marungu Mixed Secondary School
527.	Coast	Voi	Mwakichuchu Mixed Secondary School
528.	Coast	Voi	Mwangea Secondary School
529.	Coast	Voi	David Kayada Secondary School
530.	Coast	Voi	Mwambiti Secondary School
531.	Eastern	Wajir North	Bute Boys Secondary School
532.	Eastern	Wajir North	Bute Girls Secondary School
533.	Eastern	Wajir North	Buna Secondary School
534.	Nyanza	West Mugirango	St. Peters Nyakemincha Secondary School
535.	Nyanza	West Mugirango	Kebirigo Mixed Secondary School
536.	Nyanza	West Mugirango	Gekomoni Technology Secondary School
537.	Nyanza	West Mugirango	Marindi Secondary School
538.	Nyanza	West Mugirango	St. Charles Lwanga Nyansabakwa Secondary School
539.	Nairobi	Westlands	Hospital Hill High School
540.	Nairobi	Westlands	State House Girls
541.	Nairobi	Westlands	Kangemi High School
542.	Nairobi	Westlands	Parklands arya girls High School
543.	Nairobi	Westlands	St. Georgies Girls School
544.	Rift Valley	Baringo	Oinobmoi Secondary

		Central	School
545.	Rift Valley	Baringo Central	Kituro High school
546.	Rift Valley	Baringo Central	Pemwai Girls Secondary School
547.	Rift Valley	Baringo North	Ayiebo Secondary School
548.	Rift Valley	Baringo North	Tanyileel Secondary School
549.	Rift Valley	Baringo North	Katibel Secondary School
550.	Rift Valley	Baringo North	Poi Secondary School
551.	Rift Valley	Bureti	Arokyet Secondary School
552.	Rift Valley	Bureti	AIC Girls High School Litein
553.	Rift Valley	Bureti	Tebesonik Secondary School
554.	Rift Valley	Eldoret East	Seko Girls High School
555.	Rift Valley	Eldoret East	Chebisaas Boys High School
556.	Central	Gichugu	Gatunguru Secondary
557.	Central	Gichugu	Kianyambo Secondary School
558.	Central	Gichugu	Kianguenyi Secondary
559.	Central	Gichugu	Rwambiti Secondary School
560.	Central	Juja	Broadway Secondary School
561.	Central	Juja	Juja Farm Secondary School
562.	Eastern	Mbooni	Muthwani Secondary School
563.	Coast	Msambweni	Ngozi Girls Secondary school
564.	Coast	Msambweni	Lungalunga Secondary school
565.	Coast	Msambweni	Kinondo Secondary school
566.	Coast	Msambweni	Kingwede Secondary school
567.	Coast	Msambweni	Mivumoni Secondary school
568.	Western	Mumias	St. Peters Boys High School
569.	Western	Mumias	St. Mary's Girls Secondary School
570.	Western	Mumias	St. Pauls Lubinu Boys Secondary School

571.	Western	Mumias	St. Martha's Mwitoti Secondary School
572.	Western	Mumias	ACK Milimani Girls Secondary School
573.	Coast	Mwatate	Ngami Secondary School
574.	Coast	Mwatate	Mwafuga Secondary School
575.	Eastern	Mwingi North	Kaela Secondary School
576.	Rift Valley	Nakuru	Mogoon Secondary school
577.	Rift Valley	Nakuru	Upper Hill Mixed Secondary school
578.	Rift Valley	Nakuru	Crater View Secondary school
579.	Rift Valley	Nakuru	Lanet Secondary school
580.	Rift Valley	Nakuru	Nakuru Central Secondary school
581.	Nyanza	North Mugirango	Mwongori Secondary
582.	Nyanza	North Mugirango	St. Patricks Kahawa Secondary
583.	Nyanza	Nyakach	Naki Secondary School
584.	Nyanza	Nyakach	Olembo Secondary School
585.	Nyanza	Nyakach	Sigoti Complex Girls Secondary School
586.	Nyanza	Nyakach	Nyong'onga Secondary School
587.	Nyanza	Nyakach	Thurgem Secondary School
588.	Nyanza	Nyando	Withur Boys Secondary School
589.	Nyanza	Rongo	Nyarach Secondary School
590.	Nyanza	Rongo	Kameji Secondary School
591.	Nyanza	Rongo	Oyugi Ogango Secondary School
592.	Nyanza	Rongo	Yago Mixed Secondary School
593.	Nyanza	Rongo	Kokuro Boys Secondary School
594.	Rift Valley	Samburu West	AIC Moi Girls Secondary School
595.	Eastern	South Imenti	Gikurune Boys Secondary School
596.	Eastern	South Imenti	Kithunguri Day Secondary School

597.	Eastern	South Imenti	Gakuuni Girls Secondary School
598.	Eastern	South Imenti	Igoki Boys Secondary School
599.	Eastern	South Imenti	Kathera Secondary School
600.	Nairobi	Starehe	Ndururuno Mixed Secondary
601.	Rift Valley	Turkana South	AGC - Lokichar
602.	Nyanza	Uriri	Oruba Girls Sec. School
603.	Nyanza	Uriri	Mukuyu Mixed Sec. School
604.	Nyanza	Uriri	Bishop Linus Okok Osogo Sec. School
605.	Nyanza	Uriri	Arambe Mixed Sec. School
606.	Nyanza	Uriri	St. Joseph's High School Rapogi
607.	Western	Webuye	St. Mathews ACK Secondary School
608.	Western	Webuye	Sipala Friends Secondary School
609.	Western	Webuye	Namawanga Girls Secondary School
610.	Eastern	Yatta	Mavoloni Secondary
611.	Eastern	Yatta	Kaluluini Secondary
612.	Eastern	Yatta	Kithendu Secondary
613.	Eastern	Yatta	Fr. Makewa Secondary
614.	Eastern	Yatta	Yumbuni Secondary
615.	Rift Valley	Ainamoi	Soliat Boys' Secondary School
616.	Rift Valley	Ainamoi	Poiywek Secondary School
617.	Rift Valley	Ainamoi	Kericho High School
618.	Rift Valley	Ainamoi	Chebigen
619.	Rift Valley	Ainamoi	Ngeny Koiborot Secondary School
620.	Rift Valley	Aldai	Chepkong'ny Mixed Secondary School
621.	Rift Valley	Aldai	Bonjoge Boys Secondary School
622.	Rift Valley	Aldai	Serem Secondary School
623.	Rift Valley	Aldai	Kemeloi Secondary School
624.	Rift Valley	Aldai	Kapkures Mixed Secondary School
625.	Coast	Bahari	Kilifi Township

			Secondary School
626.	Coast	Bahari	Bahari Girls Secondary School
627.	Coast	Bahari	Msumarini Secondary School
628.	Coast	Bahari	Lutsangani Secondary School
629.	Coast	Bahari	St. Theresa's Gilrs Secondary School
630.	Rift Valley	Baringo Central	Mochongoi Secondary School
631.	Rift Valley	Baringo East	Tangulbei Secondary
632.	Rift Valley	Baringo North	Arap Moi Secondary School Rimo
633.	Nyanza	Bomachoge	Moteiribe Mixed
634.	Rift Valley	Bureti	Tulwet Secondary School
635.	Rift Valley	Bureti	Ngesumin Girls' Secondary School
636.	Western	Butere	Bumamu Secondary School
637.	Western	Butere	St. Paul Shikunga Secondary School
638.	Western	Butere	St. Mark Bulanda Secondary School
639.	Western	Butere	Butere Girls Secondary School
640.	Western	Butere	Manyala Secondary School
641.	Western	Butula	Kingandole Secondary School
642.	Western	Butula	Lugulu AC Secondary School
643.	Eastern	Central Imenti	Kaongo Girls Secondary School
644.	Eastern	Central Imenti	Kinjo Girls Secondary School
645.	Eastern	Central Imenti	Mariene Day Secondary School
646.	Eastern	Central Imenti	Kibirichia Boys Secondary School
647.	Rift Valley	Chepalungu	Kaboson Secondary School
648.	Rift Valley	Chepalungu	Kipsuter Boys Secondary School
649.	Rift Valley	Chepalungu	Lugumek Secondary School
650.	Rift Valley	Chepalungu	Tumoi Secondary School

651.	Rift Valley	Chepalungu	Itembe Secondary School
652.	Rift Valley	Cherangany	Wiyeta Girls Secondary
653.	Rift Valley	Cherangany	Friends Bwake Secondary
654.	Rift Valley	Cherangany	Kapcheplanget
655.	Rift Valley	Cherangany	St. Marks Boys
656.	Rift Valley	Cherangany	St. Christophers
657.	North Eastern	Dujis	Balambala Secondary School
658.	Rift Valley	Eldama Ravine	Baringo High school
659.	Rift Valley	Eldama Ravine	Poror High School
660.	Rift Valley	Eldama Ravine	Torongo Girls Secondary School
661.	Rift Valley	Eldama Ravine	Solian Girls High School
662.	Rift Valley	Eldama Ravine	Timboroa Secondary School
663.	Rift Valley	Eldoret East	Kapngetuny high school
664.	Rift Valley	Eldoret East	Kemeliet Secondary School
665.	Rift Valley	Eldoret East	RCEA Plateau Girls Secondary School
666.	Rift Valley	Eldoret North	Sugoi Girls
667.	Rift Valley	Eldoret North	Ziwa Secondary
668.	Rift Valley	Eldoret North	Murgusi Secondary
669.	Rift Valley	Eldoret North	Soy Secondary
670.	Rift Valley	Eldoret North	Kiborom Secondary
671.	Nairobi	Embakasi	Ruai Girls
672.	Nairobi	Embakasi	Jehova Jire Secondary
673.	North Eastern	Fafi	Bura Boys
674.	North Eastern	Fafi	Fafi Girls Secndary
675.	Eastern	Gachoka	Mbondoni Secondary School
676.	Eastern	Gachoka	Machang'a Secondary School
677.	Eastern	Gachoka	St. Clare Girls Secondary School
678.	Eastern	Gachoka	Con. Gitaraka Secondary School
679.	Coast	Galole	Hola Boys Secondary School
680.	Coast	Galole	Mau Mau Memorial

			Secondary School
681.	Coast	Galole	Ndura Mixed Day Secondary School
682.	Coast	Ganze	Mwangea Girls Secondary School
683.	Coast	Ganze	Ganze Girls Secondary School
684.	Coast	Ganze	Vitengeni Baptist Secondary School
685.	Coast	Ganze	Soko Secondary School
686.	Coast	Ganze	Jaribuni Secondary School
687.	Coast	Garsen	Ngao Girls Secondary
688.	Coast	Garsen	Gadeni Secondary School
689.	Coast	Garsen	Kipini Secondary
690.	Coast	Garsen	Garseni Secondary School
691.	Nyanza	Gem	Uranga Mixed Secondary School
692.	Central	Githunguri	PCEA Mukua Secondary School
693.	Central	Githunguri	Gitiha Secondary School
694.	Central	Githunguri	Gathugu Secondary School
695.	Central	Githunguri	St. Vincent Lioki Secondary School
696.	Central	Githunguri	Kiairia High school
697.	Nyanza	Gwasssi	Nyatoto Secondary School
698.	Western	Hamisi	Nyang'ori Boys Secondary
699.	Western	Hamisi	Erusui Girls
700.	Western	Hamisi	Dr. Maurice Dangana
701.	Western	Hamisi	Gisambai Secondary
702.	Western	Hamisi	Muhudu Secondary
703.	Eastern	Igembe South	Maua Girls Secondary School
704.	Eastern	Igembe South	Auki Secondary School
705.	Eastern	Igembe South	Kilima mungu Secondary School
706.	Eastern	Igembe South	Nturuba Secondary School
707.	Eastern	Igembe South	Kirindine Secondary School
708.	Western	Ikolomani	Musingu High School

709.	Western	Ikolomani	Eregi Girls
710.	Western	Ikolomani	Lirhembe Girls
711.	Western	Ikolomani	Bushianga Secondary
712.	Western	Ikolomani	Shamusingiri Secondary
713.	Eastern	Isiolo south	Kinna Secondary School
714.	Rift Valley	Kacheliba	St Comboni Amakuriat Secondary School
715.	Rift Valley	Kacheliba	Kacheliba Secondary School
716.	Rift Valley	Kacheliba	Konyao Mixed Secondary School
717.	Rift Valley	Kacheliba	St. Ann Chelopoy Girls Secondary School
718.	Rift Valley	Kacheliba	Alale Girls Secondary School
719.	Eastern	Kaiti	Kivani Secondary
720.	Eastern	Kaiti	Nguluni Secondary
721.	Rift Valley	Kajiado Central	Sajiloni Girls
722.	Rift Valley	Kajiado Central	Thomas Fish
723.	Rift Valley	Kajiado Central	Ilbissil Girls
724.	Rift Valley	Kajiado Central	Elerai Girls
725.	Rift Valley	Kajiado Central	Nkoile Boys
726.	Rift Valley	Kajiado North	Ewuaso Girls
727.	Coast	Kaloleni	Ribe Boys Secondary school
728.	Coast	Kaloleni	Mariakani boys Secondary school
729.	Coast	Kaloleni	Kombeni Girls Secondary school
730.	Coast	Kaloleni	Kizurini Mixed Secondary school
731.	Coast	Kaloleni	Kambe Mixed Secondary school
732.	Nairobi	Kamukunji	Our Lady of Mercy - Shauri Moyo
733.	Eastern	Kangundo	Fr. Heeran High School - Nguluni
734.	Eastern	Kangundo	S.A. Kinyui Boys High School
735.	Eastern	Kangundo	Katulye Secondary School
736.	Eastern	Kangundo	Kawethei Secondary School

737.	Eastern	Kangundo	Kitwii Secondary School
738.	Rift Valley	Kapenguria	Kapenguria Boys
739.	Rift Valley	Kapenguria	St. Cecilia Chepareria Girls
740.	Rift Valley	Kapenguria	Meshack Tumkou Secondary
741.	Rift Valley	Kapenguria	Sook Boys Secondary
742.	Rift Valley	Kapenguria	Karenger Boys Secondary
743.	Nyanza	Kasipul Kabondo	Ringa Boys Secondary School
744.	Rift Valley	Keiyo North	Kipsoen Secondary School
745.	Rift Valley	Keiyo North	Kaptum Secondary School
746.	Rift Valley	Keiyo North	Sergoit Secondary School
747.	Rift Valley	Keiyo North	Kessup Day Secondary School
748.	Rift Valley	Keiyo North	Kapkessum Secondary School
749.	Rift Valley	Keiyo South	Kaptagat Girls Secondary School
750.	Rift Valley	Keiyo South	Kimwogo Mixed Day Secondary School
751.	Rift Valley	Keiyo South	St. Josephs Kipsaina Secondary School
752.	Rift Valley	Keiyo South	Kipsaos Secondary School
753.	Rift Valley	Keiyo South	Kimwarer Secondary School
754.	Central	Kigumo	Mariira Secondary School
755.	Central	Kigumo	Makomboki Secondary School
756.	Central	Kigumo	Rarakwa Secondary School
757.	Central	Kigumo	Muthithi Secondary School
758.	Central	Kigumo	Githima Secondary School
759.	Western	Kimilili	Mbakalo Friends
760.	Coast	Kinango	Kinango Secondary School
761.	Coast	Kinango	Ndavaya Secondary School
762.	Coast	Kinango	Macknon Road Secondary School

763.	Coast	Kinango	Samburu Secondary School
764.	Coast	Kinango	Mwavumbo Secondary School
765.	Rift Valley	Kipkelion	Kokwet Secondary School
766.	Rift Valley	Kipkelion	Baraka Secondary School
767.	Rift Valley	Kipkelion	Taita Towett Secondary School
768.	Rift Valley	Kipkelion	Lesirwo Secondary School
769.	Rift Valley	Kipkelion	ChilChila Secondary School
770.	Central	Kirinyaga Central	Kiabarikiri Day Mixed Sec.
771.	Coast	Kisauni	Mbaraki Girls Secondary
772.	Coast	Kisauni	Serani Boys Secondary
773.	Coast	Kisauni	Maweni Mixed Secondary
774.	Coast	Kisauni	Mwakirunge Mixed Secondary
775.	Coast	Kisauni	Mombasa Secondary
776.	Eastern	Kitui Central	Kamandio Secondary School
777.	Nyanza	Kuria	Kehancha Mixed Secondary School
778.	North Eastern	Lagdera	Modogashe Secondary School
779.	Rift Valley	Laikipia East	Inoro Secondary School
780.	Rift Valley	Laikipia East	Ngobit Secondary School
781.	Rift Valley	Laikipia East	St. Jude Nturukuma Secondary School
782.	Rift Valley	Laikipia East	Doldol Boys Secondary School
783.	Rift Valley	Laikipia East	Kalalu Secondary School
784.	Rift Valley	Laikipia West	Munyaka Secondary School
785.	Rift Valley	Laikipia West	Ndindika Secondary school
786.	Rift Valley	Laikipia West	Muhotetu Boarding Girls
787.	Rift Valley	Laikipia West	Ol ngarua
788.	Rift Valley	Laikipia West	Ol Arinyiro Secondary
789.	Eastern	Laisamis	Loiyangalani Secondary School

790.	Coast	Lamu East	Faza Secondary School
791.	Coast	Lamu East	Kizingitini Secondary School
792.	Coast	Lamu East	Kiunga secondary School
793.	Coast	Lamu West	Mkunumbi Secondary
794.	Coast	Lamu West	Witu Secondary
795.	Coast	Lamu West	Hongwe Secondary
796.	Coast	Lamu West	Hindi Secondary School
797.	Central	Lari	Kinale High School
798.	Central	Lari	Kirenga Girls
799.	Central	Lari	Kambaa Girls
800.	Central	Lari	Kamburu Mixed
801.	Central	Lari	Nduriri Mixed
802.	Western	Lugari	Mautuma Mixed Secondary School
803.	Western	Lugari	Bishop Sulumeti Girls Secondary School
804.	Western	Lurambi	Sidikho Secondary School
805.	Western	Lurambi	St. Caroli Lwanga Lutaso Secondary School
806.	Western	Lurambi	Kilimo Secondary School
807.	Western	Lurambi	
808.	Western	Lurambi	Shieywe Mixed Secondary School
809.	Coast	Magarini	Shujaa Mekatilili Secondary School
810.	Coast	Magarini	Garashi Secondary School
811.	Nairobi	Makandara	Our Lady of Mercy South B Secondary School
812.	Eastern	Makueni	Kiangini Girls
813.	Eastern	Makueni	Barazani Girls Secondary
814.	Eastern	Makueni	Mweini Secondary
815.	Eastern	Makueni	St. John's Malivani
816.	Western	Malava	Kimang'eti Secondary School
817.	Western	Malava	Samitsi Secondary School
818.	Western	Malava	Kakunga Girls Secondary School
819.	Western	Malava	Silungai Secondary School
820.	Western	Malava	Mugai Secondary

			School
821.	North Eastern	Mandera Central	Rhamu Dimtu Secondary
822.	North Eastern	Mandera Central	As habito Secondary
823.	North Eastern	Mandera Central	Rhamu Girls Secondary
824.	North Eastern	Mandera Central	Elwak Mixed Secondary School
825.	North Eastern	Mandera Central	Wargadud Secondary School
826.	North Eastern	Mandera East	Barwako Boys Secondary School
827.	North Eastern	Mandera East	Khadija Girls Secondary School
828.	North Eastern	Mandera West	Takaba Boys Secondary School
829.	North Eastern	Mandera West	Takaba Girls Secondary School
830.	North Eastern	Mandera West	Takaba Day Secondary School
831.	North Eastern	Mandera West	Wayam Boys Secondary School
832.	North Eastern	Mandera West	Banisa Mixed Day Secondary School
833.	Central	Maragwa	Munguini Secondary School
834.	Central	Maragwa	Kamahuha Girls Secondary School
835.	Central	Maragwa	Makuyu Girls Secondary School
836.	Central	Maragwa	Kirimiri Secondary School
837.	Central	Maragwa	Peter Kariuki Secondary School
838.	Rift Valley	Marakwet East	Kerio Valley Secondary
839.	Rift Valley	Marakwet East	Chesewew Secondary
840.	Rift Valley	Marakwet East	St. Paul Kapkondot
841.	Rift Valley	Marakwet East	St. Mary's Mon
842.	Rift Valley	Marakwet East	St. Michael's Secondary
843.	Rift Valley	Marakwet West	St. Benedicts Arror
844.	Eastern	Masinga	Kithyoko Secondary School
845.	Eastern	Masinga	Kitangani Secondary School
846.	Eastern	Masinga	Kwawanzilu Secondary School
847.	Eastern	Masinga	Kaseve Secondary

			School
848.	Eastern	Masinga	Iiani Mixed Secondary School
849.	Central	Mathioya	Gikoe Secondary School
850.	Central	Mathioya	Gitugi Secondary School
851.	Central	Mathioya	J. M. Kairo Secondary School
852.	Central	Mathioya	Iruri Secondary School
853.	Central	Mathioya	Kiriko Secondary School
854.	Nyanza	Mbita	Lambwe Secondary School
855.	Nyanza	Mbita	Mauta Secondary School
856.	Eastern	Mbooni	Kako Secondary School
857.	Eastern	Mbooni	Kitoto Secondary School
858.	Nyanza	Migori	Migori Boys Secondary School
859.	Nyanza	Migori	Magongo Ribe Mixed Secondary School
860.	Nyanza	Migori	St. Michael Nyarongi Secondary School
861.	Nyanza	Migori	Moi Suba Girls Secondary School
862.	Nyanza	Migori	Nyanduong Secondary School
863.	Rift Valley	Mosop	St. monica Girls Secondary School - Kapkoros
864.	Rift Valley	Mosop	Ngechek Secondary School
865.	Rift Valley	Mosop	St. Theresa of Avilla - Ndalat
866.	Rift Valley	Mosop	Lelmokwo Boys Secondary School
867.	Rift Valley	Mosop	Tabolwa Secondary School
868.	Eastern	Moyale	Manyatta Mixed day Secondary School
869.	Eastern	Moyale	Sololo Boys Secondary School
870.	Nyanza	Muhoroni	Kibigori Secondary School
871.	Eastern	Mutito	Thua Secondary School
872.	Eastern	Mutito	Kyanika Secondary School
873.	Eastern	Mutito	Endau Mixed

			Secondary
874.	Eastern	Mutito	Voo Secondary
875.	Eastern	Mutito	Mwitika Mixed Secondary
876.	Coast	Mvita	Khamis Secondary
877.	Coast	Mwatate	Mwandango Secondary School
878.	Coast	Mwatate	Allan Mjomba Secondary School
879.	Eastern	Mwingi North	Kimangao Boys Secondary School
880.	Eastern	Mwingi North	Mivukoni Mixed Secondary School
881.	Eastern	Mwingi North	Tseikuru Secondary School
882.	Eastern	Mwingi North	Kadse Secondary School
883.	Eastern	Mwingi South	Katalwa Secondary School
884.	Rift Valley	Naivasha	Kahuho Mixed/Girls Boarding
885.	Rift Valley	Naivasha	Gilgil Day Mixed
886.	Rift Valley	Naivasha	Maai Mahiu Girls Boarding
887.	Rift Valley	Naivasha	Maiella Mixed Day
888.	Rift Valley	Naivasha	Nyondia Mixed Day
889.	Western	Nambale	Nambale Urban Mixed Secondary School
890.	Western	Nambale	St. Pauls Igara mixed Secondary School
891.	Rift Valley	Narok South	Moi Naikarra Secondary school
892.	Rift Valley	Narok South	Sogoo Secondary school
893.	Rift Valley	Narok South	Loita Secondary school
894.	Rift Valley	Narok South	Ololulunga Secondary school
895.	Rift Valley	Narok South	Naroosura Secondary school
896.	Nyanza	Ndhiwa	Obera Boys Secondary School
897.	Nyanza	Ndhiwa	Okok Mixed Secondary School
898.	Nyanza	Ndhiwa	Got Kojowi Secondary School
899.	Nyanza	Ndhiwa	St. Gabriel Miranga Secondary School
900.	Nyanza	Ndhiwa	Mirogi Girls Secondary School

901.	Eastern	North Horr	North Horr Boys Secondary
902.	Eastern	North Horr	North Horr Girls Secondary
903.	Eastern	North Horr	Dr. Godana Boys Secondary
904.	Eastern	North Horr	Maikona Girls Secondary
905.	Nyanza	North Mugirango	Nyamiranga SDA
906.	Nyanza	North Mugirango	Ikonge Girls
907.	Nyanza	North Mugirango	Ntana Secondary School
908.	Nyanza	Nyando	St. Camulus Ogwedhi Sec.
909.	Nyanza	Nyando	Ong'eche Mixed Secondary School
910.	Nyanza	Nyando	Nyakakana Mixed Secondary School
911.	Nyanza	Nyaribari Chache	Bobaracho Secondary School
912.	Nyanza	Nyaribari Chache	Riondonga Secondary School
913.	Nyanza	Nyaribari Chache	Boruma Secondary School
914.	Nyanza	Nyaribari Chache	Nyaura Secondary School
915.	Nyanza	Nyaribari Chache	Nyosia Secondary School
916.	Nyanza	Rarieda	Nyabera Secondary School
917.	Nyanza	Rarieda	Gagra Secondary School
918.	Nyanza	Rarieda	Mahaya Secondary School
919.	Nyanza	Rarieda	Kitambo Secondary School
920.	Nyanza	Rarieda	St. Mathews Kandaria Secondary School
921.	Western	Sabatia	Friends School Kigama Boys
922.	Western	Sabatia	Chamakanga Girls
923.	Western	Sabatia	Chandumba Mixed Secondary
924.	Western	Sabatia	Mukingi Secondary
925.	Western	Sabatia	Jemovo Secondary
926.	Rift Valley	Saboti	Holy Trinity Saboti Boys

927.	Eastern	Saku	Moi Girls Secondary School
928.	Eastern	Saku	Dakabaricha Secondary School
929.	Eastern	Saku	Marsabit Mixed Day Secondary School
930.	Rift Valley	Samburu East	Wamba Girls' Secondary
931.	Rift Valley	Samburu East	Wamba Boys' Secondary
932.	Rift Valley	Samburu East	Waso Secondary
933.	Western	Shinyalu	Museno Secondary School
934.	Western	Shinyalu	Handidi Secondary School
935.	Rift Valley	Sigor	ELCK Chesta Girls Secondary School
936.	Rift Valley	Sigor	Holy Rosary Girls Secondary School
937.	Rift Valley	Sigor	St. Comboni Kaptabuk Secondary School
938.	Rift Valley	Sigor	Wei- Wei Secondary School
939.	Rift Valley	Sigor	Cheptulel Boys Secondary School
940.	Western	Sirisia	Busakala Mixed Secondary School
941.	Western	Sirisia	Luuya Girl's Secondary School
942.	Western	Sirisia	Chebukwa Mixed Secondary School
943.	Rift Valley	Sotik	Gelegele Boys Secondary School
944.	Rift Valley	Sotik	Kapkelei Mixed Secondary School
945.	Rift Valley	Sotik	Moi Minariet Boys Secondary School
946.	Rift Valley	Sotik	Chesilyot Girls Secondary School
947.	Rift Valley	Sotik	Kamureito Secondary School
948.	Coast	Taveta	Chala Secondary school
949.	Coast	Taveta	Eldoro Secondary school
950.	Coast	Taveta	Bishop John Njenga Secondary school
951.	Coast	Taveta	Kitobo Secondary school
952.	Eastern	Tharaka	Gaciongo Secondary

			school
953.	Eastern	Tharaka	Kathangachini Secondary school
954.	Eastern	Tigania West	Thinyaine Mixed Day Sec.
955.	Eastern	Tigania West	Kianjai Boys
956.	Eastern	Tigania West	Uringu Girls
957.	Eastern	Tigania West	Kitheo Mixed Secondary
958.	Eastern	Tigania West	Kimachia Mixed Secondary
959.	Rift Valley	Tinderet	St. John's Tachasis Secondary School
960.	Rift Valley	Tinderet	Tinderet Secondary School
961.	Western	Turkana Central	Turkana Girls Secondary School
962.	Western	Turkana Central	Turkwel Boys Secondary School
963.	Western	Turkana Central	Moi High School Kalokol
964.	Western	Turkana Central	Lodwar PAG Secondary School
965.	Rift Valley	Turkana North	Kakuma Boys Secondary School
966.	Rift Valley	Turkana North	Our Lady's Girls Secondary School
967.	Rift Valley	Turkana North	AIC Songot Boys Secondary School
968.	Rift Valley	Turkana North	Tarach Secondary School
969.	Rift Valley	Turkana North	Lopiding Girls Secondary School
970.	North Eastern	Wajir East	Sabunley Secondary
971.	North Eastern	Wajir East	Furaha Mixed Day
972.	North Eastern	Wajir East	Waberi Mixed Day
973.	North Eastern	Wajir South	Senior Chief ogle Girls
974.	North Eastern	Wajir South	Habaswein Mixed Day Sec.
975.	North Eastern	Wajir South	Biyamathow Secondary
976.	North Eastern	Wajir South	Abakore Mixed Day Sec.
977.	North Eastern	Wajir West	Griftu Boys Secondary School

978.	North Eastern	Wajir West	Hon. Khalif Girls Secondary School
979.	North Eastern	Wajir West	Eldas Secondary School
980.	North Eastern	Wajir West	Hadado Secondary School
981.	North Eastern	Wajir West	Ademasajida Secondary School
982.	Western	Webuye	Sitikho Friends Secondary School
983.	Western	Webuye	St Francis Makemo R C
984.	Nyanza	Bonchari	Itibo Elck Boys Secondary
985.	Nyanza	Bonchari	Isamwera Mixed Sec
986.	Nyanza	Bonchari	St.Vincent Omwari
987.	Nyanza	Bonchari	Botoro Mixed Secondary
988.	Nyanza	Bonchari	St Theresas Bogiakumu
989.	Rift Valley	Emgwen	ACK Kaptel Girls' Secondary school
990.	Western	Funyula	Sigalame High school
991.	Western	Funyula	St. Cecilia Nangina Girls High school
992.	Western	Funyula	Namboboto Secondary School
993.	Western	Funyula	St. Thomas Aquinas Nanderema Sec. Sch.
994.	Western	Funyula	Nyakhobi Secondary School
995.	Coast	Galole	Wenje Secondary School
996.	Coast	Galole	Daku Mixed Day Secondary School
997.	Eastern	Isiolo south	Sericho Secondary School
998.	Eastern	Kitui South	St. Patricks Secondary School
999.	Eastern	Kitui South	Mathima Secondary School
1000.	Eastern	Kitui South	Kituti Secondary School
1001.	Eastern	Kitui South	Kanziko Secondary School
1002.	Eastern	Kitui South	Ikanga Boys Secondary School
1003.	North Eastern	Lagdera	Dadaab Secondary School
1004.	North Eastern	Lagdera	Benane Secondary School

1005.	North Eastern	Lagdera	Kulan Secondary School
1006.	North Eastern	Lagdera	Shantabaq Secondary School
1007.	Coast	Lamu West	Bahari Secondary
1008.	Coast	Matuga	Lukore Secondary School
1009.	Eastern	Moyale	Obbu Girls Secondary School
1010.	Eastern	Mwingi South	Kalitini Secondary School
1011.	Central	Ol Kalou	Weru Secondary
1012.	Central	Ol Kalou	Silibwet Secondary
1013.	Rift Valley	Samburu West	PCEA Tuum Girls Secondary
1014.	Coast	Taveta	Mata Secondary school
1015.	Western	Turkana Central	Kerio Secondary School
1016.	Rift Valley	Turkana South	Kainuk mixed
1017.	Rift Valley	Turkana South	Katilu Boys
1018.	Rift Valley	Turkana South	RCEA Lokori Secondary School
1019.	Rift Valley	Turkana South	AIC Kangitit Girls Secondary School
1020.	North Eastern	Wajir East	Kutulo Girls
1021.	North Eastern	Wajir East	Ahmed Liban Mixed day

7.7 Reliability Tests

Scale: ALL VARIABLES

Case Processing Summary

Reliability Statistics

Item Statistics

	Mean	Std. Deviation	N
There is easy access to digital content within the school	3.11	1.277	57
The content is packaged in an easy to use format	3.56	1.150	57
The content has covered all areas of the curriculum in my subject	3.33	1.185	57

	N	%
Cases Valid	57	89.1
Excluded ^a	7	10.9
Total	64	100.0

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.915	.916	28

Mean	Variance	Std. Deviation	N of Items
97.77	330.536	18.181	28

Fig 7.71 Reliability statistics

	Mean	Std. Deviation	N
Digital materials to support curriculum are readily available and accessible	3.05	1.187	57
11.Digital content has be integrated into the teaching and learning process	3.96	1.101	57
Digital content enhances learners understanding of concepts	4.33	.913	57
Digital content can replace the role of teachers in a classroom	2.70	1.375	57
Digital content has reduced teachers workload	3.46	1.255	57
Digital content has improved the quality of classroom teaching and learning	4.07	1.033	57
Digital content has enhanced learners concentration in class	3.95	1.202	57
Digital content resources enhance delivery of content in teaching and learning	4.19	.972	57
Administrative support [As an e-content user, I find the materials readily available	3.25	1.199	57
I get enough training and exposure on how to utilize e-content	3.49	1.197	57

	Mean	Std. Deviation	N
The field officers provide information on available e-content	3.23	1.282	57
The manuals gave me the information I needed to learn about and prepare for the digital content.	3.65	1.110	57
The e-learning materials provided were useful in integrating in classroom teaching and learning.	3.65	1.110	57
The design and format of the e-learning content facilitate student centric learning	3.79	.959	57
The infrastructure in my school supports access and use of e-learning material	3.44	1.254	57
The digital content uses tools that are easy to understand and utilize in class	3.58	1.238	57
I have been able to integrate e- learning resources into the teaching and learning process in my subject	3.56	1.239	57
e- learning resources have enhanced my understanding of concepts in my subject	3.65	1.172	57
I feel that e-learning has replaced the role of a teacher in a classroom	2.68	1.198	57
e- learning resources has helped in reducing my workload	3.39	1.306	57
I feel e-learning has improved the quality of classroom teaching and learning	3.86	1.076	57
There is easy access to digital content outside school	3.19	1.187	57
I can navigate easily within the digital material	3.53	1.241	57
My subject needs are met by the materials	3.25	1.229	57
My teaching requirements are met by the material	2.88	1.240	57

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
There is easy access to digital content within the school	.67	.22	.22	.07	.60

	There is easy access to digital content within the school	The content is packaged in an easy to use format	The content is covered all areas of the curriculum in my subject	Digital materials to support curriculum are readily accessible	11. Digital content has been integrated into the teaching and learning process	Digital content enhances learners understanding of concepts	Digital content can replace the role of teachers in a classroom
There is easy access to digital content within the school	1.000	.372	.201	.479	.422	.291	.150
The content is packaged in an easy to use format	.372	1.000	.411	.331	.058	-.113	-.107
The content has covered all areas of the curriculum in my subject	.201	.411	1.000	.559	.050	-.121	.139

	Digital content has reduced teachers workload	Digital content has improved the quality of classroom teaching and learning	Digital content has enhanced learners concentration in class	Digital resources enhance delivery of content in teaching and learning	Administrative support [As user, I find the materials readily available	I get enough training and exposure on how to utilize e-content	The field officers provide information on available e-content	The manuals gave me the information I needed to learn about and prepare for the digital content.
There is easy access to digital content within the school	.070	.252	.260	.329	.542	.293	.280	.140
The content is packaged in an easy to use format	.092	.252	.138	-.035	.118	.289	.323	.297
The content has covered all areas of the curriculum in my subject	.208	-.034	-.075	-.134	.368	.348	.407	.294

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Iv I feel that e-learning has replaced the role of a teacher in a classroom	95.09	311.796	.409	.862	.914
e- learning resources has helped in reducing my	94.39	310.098	.407	.659	.914

