

Preparedness of Public Secondary Schools in Integration of Information Communication Technology in Teaching-Learning Process In Nyeri South District Kenya

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Abstract

The advances in technology world over are taking place at a very alarming rate. All sectors of production are impressing technology in their service delivery and since education plays a major role in all aspects of development, it cannot be left behind. In many cases education is given in schools whether formally or informally therefore they should be prepared for this challenge. The study therefore aimed at examining the preparedness of secondary schools in the integration of Information Communication and Technology (ICT) to enhance teaching-learning process. Three objectives guided the study; To examine the secondary schools' ability in the integration of ICT in teaching and learning process, determine the level of teachers' and students' expertise in integration of ICT in teaching and learning process and the extent to which ICT is being integrated in teaching and learning process by teachers and students in Nyeri South District Kenya. A survey study was done in all the 34 schools in the district. It was found that schools have the capacity to initiate the integration of ICT in the teaching-learning process the challenge however is on the capacity of the teachers and principals. It is recommended that schools should be active in capacity building to equip the teachers with the necessary skills and knowledge on how to impress ICT in the teaching-learning process to move away from the traditional modes of delivery that seem out of times with the learners.

Keywords: information communication and technology, computer peripheral tools, integration, teaching-learning process

INTRODUCTION

Education has remained the main corner-stone for economic development and improvement of human welfare from time in memorial. However, as global economic competition grows stiffer, delivery of educational services for the realization of this important function becomes a challenge to many countries especially developing ones. Countries have to develop their economies using the knowledge and skills acquired through education to attract investment and hence create jobs for the youth Srivatsava, (2002). Education further is one of the major determinants of sustainable life-long earnings. Countries therefore, should strive frequently to raise educational attainment of its people as a way of tackling poverty and other human deprivation given that the world today demands for knowledge-based economies of production (UNESCO 2005).

Traditional modes of delivery based on the use of textbooks and the teacher occupying the centre stage are no more functioning. At higher institutions of learning and in private academies computer use and internet surfing is the order of the day. Therefore, in every country at any given level of economic development, there is a great demand for education reform to embrace information and technology in order to be able to face the prevailing political, social and cultural changes as well as scientific and technological transformations (UNESCO Educational policy and Reforms 2008). Since 1990, many governments have been promoting the use of

Information communication Technologies (ICT) in education, particularly to expand access for the ever expanding populations and improve the quality of education given to them.

Although ICT is now at the center of education reform efforts world over, not all countries are currently able to benefit from this development and advances that technology can offer. There are significant barriers to it. There is what is often referred to as digital divide that limit the ability of some countries to take advantage of technological development (Kozma and Anderson 2002). The developing countries are faced with challenges related to access, pedagogy or assessment when using ICTs to improve and reinforce education.

The government of Kenya recognizes the benefits of ICT Integration in Education at all levels. The Kenya Economic Recovery Strategy for Wealth and Employment (2003-2007), stresses ICT as crucial for realization of the required improvements in the Curriculum at all levels. The vision of the Ministry of Education Science and Technology (MoEST) is to facilitate ICT as a universal tool for education and training. In order to achieve this vision, every educational institution, teacher, learner and their respective community should be equipped with appropriate ICT infrastructure, competencies and policies that can enable its usage and progress (Kenya National ICT Strategy GoK 2006).

A critical aspect to the successful implementation of ICT integration-related Objectives in learning institutions are the planning aspect. Pelgrum and law (2003), indicate that policy makers and educational planners play a central role in initiating change of whatever kind.

STATEMENT OF THE PROBLEM

The successful integration of ICT into the classroom warrants careful planning and depends largely on how well policy makers understand and appreciate the dynamics of such integration. Ministry of Education has placed considerable emphasis on the importance of ICT integration in education as evidenced by the promulgation of National ICT strategy in 2006 following the approval of sessional paper number one of 2005. The vision of Ministry of Education is to facilitate ICT as a universal tool for education and training and in particular stimulate ICT integration in education in various regions in the country. Research done by Brassford, Brown and Cocking (1999), showed that ICT can enhance critical thinking, information handling skills, the level of conceptualization and problem solving capacity among learners. However, according to GoK (2006) there is considerable technology lag in the Kenyan education institutions. Most of the institutions still use nearly obsolete systems and consequently are unable to exploit educational potentials of the emerging technologies. Most schools use less than 40% of their available infrastructure meant for ICT development and use. Therefore, there is a need to ensure optimum use of ICT resources by students, teachers and administrators in order to exploit educational potential of the technology. It is, therefore, against the background of the foregoing, that the researchers sought to investigate the preparedness of public secondary schools in ICT integration in enhancing teaching and learning activities in Kenya.

OBJECTIVES OF THE STUDY

- i. To examine the secondary schools' ability in the integration of ICT in teaching and learning process in Nyeri South District.
- ii. To determine the level of teachers' and students' expertise in integration of ICT in teaching and learning process in Nyeri South District.
- iii. To determine the extent to which ICT is integrated in teaching and learning process by teachers and students.

SIGNIFICANCE OF THE STUDY

The Study findings may be used to facilitate the integration of ICT in the teaching and learning process by both teachers and students in schools. This information may also be useful to administrators, policy makers and other stakeholders in finding resources for integration of ICT in the provision of

education secondary schools. The study findings may be used as a basis for the need for capacity building of teachers and other education administrators.

LIMITATIONS OF THE STUDY

Some questions of innovation and teaching in the research instruments relied on the level of ICT knowledge of the respondents however some respondents had limited knowledge in their level of ICT awareness. This was solved by use of contingency question items such that one only responded to items that applied to them and also the researchers used triangulation method by observation, questionnaires and interviews.

DELIMITATION OF THE STUDY

This study focused exclusively on level of preparedness on the utilization of ICTs in teaching and learning activities in secondary schools in Nyeri South district in Nyeri County. The findings of this research therefore may be generalized to other regions with caution since some conditions in the district may be unique and different from other areas especially those in urban set-ups.

ASSUMPTIONS OF THE STUDY

- i). Secondary school teachers and students are computer literate and are conversant with various computer usages in teaching and learning in Secondary Schools.
- ii). The study assumed that secondary schools in Nyeri South District utilize ICT in the teaching and learning process.

DEFINITION OF SIGNIFICANT TERMS

Access - opportunity or right to make use of ICT by teachers and learners.

Computer training - the process of enlightening an individual on how to use the computers

Digital Divide - It's the gap between those people with access to information and Communication Technologies (ICTs) and those who do not have.

Information Communication Technology - any product that will store, retrieve, manipulate, transmit and analyze information electronically in digital form including the internet, broadcasting technologies and mobile phones.

Information Communication Technology Integration - use of any product that will store, retrieve, manipulate, transmit and analyze information electronically to introduce, reinforce, supplement and extend learning or acquisition of skills.

RESEARCH METHODOLOGY

The study adopted a descriptive survey design. The descriptive survey was found suitable since this study sought to determine the situation on the ground on what is happening in schools as far as integration of ICT is concerned. The information was required on

the level of ICT access and usage in the various teaching and learning activities in secondary school. Target population of the study was all the 34 public secondary schools in Nyeri South district. The targeted respondents were 34 principals, 4760 students and 680 teachers (School statistics return DEO’s office Nyeri South District from School Data July 2012). A complete census sampling was used where all the schools were involved in the study. Three schools were used in the piloting of the instruments to determine their reliability. The research instruments were questionnaires for teachers and students, interview schedule for the principal of schools and observation checklist. Data collected was analyzed and presented using descriptive statistics.

RESEARCH FINDINGS

The research aimed at examining the preparedness of secondary schools in the integration of ICT in the teaching-learning process in secondary schools in Nyeri South District. Three objectives guided the study;

- i. To examine the secondary schools’ ability in the integration of ICT in teaching and learning process in Nyeri South District.
- ii. To determine the level of teachers’ and students’ expertise in integration of ICT in teaching and learning process in Nyeri South District.
- iii. To determine the extent to which ICT is integrated in teaching and learning process by teachers and students.

These objectives have been paraphrased into subheadings for the presentation of the research findings.

Secondary Schools’ Ability in the Integration of ICT in the Teaching and Learning Process in Nyeri South District

To determine the ability of secondary schools to integrate ICT in the teaching-learning process, the researchers sought to know the extent of the schools’ preparedness in the use of computer and related peripherals to support e-learning. Principals, teachers and students were asked several questions on various aspects to determine the extent of the schools’ capacity in terms of computer connectivity, numbers and the related peripherals. The responses were as described:-

All the schools under the study were connected to electricity whose supply was at times interrupted by power failures. However, only 14 (45.2%) schools had installed standby power back-up generators while 17 (54.8%) did not have power back-ups in place. Electricity connectivity is a major enabling factor for ICT integration in teaching and learning.

Principals were asked to give the number of computer teachers in their school. The response indicated that 19 (61.3%) school had each one computer teacher while 12 (38.7%) schools did not have any computer teacher. The computer teachers in the schools offered technical assistance to all the school community members including the other teachers on ICT integration. However, when teachers were asked to rate technical assistance as a potential challenge the majority 64.3% rated it as a major challenge suggesting that something still need to be done to ensure that teachers are assured of technical assistant as they endeavor to integrate ICT in their work.

The other concern was on the provision of separate rooms in the schools (computer laboratory) where teaching of ICT can be done. The majority of the school 23 (74.2%) had computer labs while 8 (25.8%) of the schools did not have computer labs. All the schools that had computer labs none of them had more than one computer lab. The distribution of desk top computers in the schools was as given in table 4.1.

Table 4.1 the distribution of desktop computers in the schools.

Number of computers	Frequency	Percent
(0-5)	8	25.8
(11-15)	6	19.4
More than 20	17	54.8
Total	31	100

Table 4.1 shows that the majority of the schools 54.8% in Nyeri South District had more than 20 computers. There were two schools that had 60 computers each. On average then the distribution of computers in the schools was 20 computers with a standard deviation of 16.91. Thus, there was a wide disparity between the numbers of desktop computers possessed by schools from one school to another. The distribution of the computers in the schools would be meaningless unless we determine the student to computer ratio. In total there were 621 computers in the schools against 13345 students. Therefore the computer to student ration was 1:22.

This ratio is significantly higher than the one estimated by the government in the 2006 statistics however, on comparison to ratio in the developed countries this value is low. For example, from a survey on technology access and use by European School Net (2012) of 31 countries (EU27, Croatia, Iceland Norway and Turkey) there are about 3 to7 student per computer in the European Union (EU). Therefore the ratio in the Nyeri schools is not good enough for easy ICT integration; the students will be

too crowded for any meaningful learning to take place.

The other concern was on the internet connectivity. The principals were asked to indicate the type of internet connectivity in their schools. The findings indicated that 51.6% of schools had internet connectivity of various types installed or used in their schools whereas 48.4% did not. Most of the schools that had connected to the internet 38.6% had wireless access while only one school (3%) had a fixed connectivity using Very Small Aperture Terminal (VSAT). The information from the school that had installed VSAT connection indicated that the internet was very reliable. The VSAT connectivity utilizes satellite transmissions and in many cases is more reliable and very appropriate for remote locations.

The peripherals for the use of ICT in the schools are equally important. Table 4.2 gives the data collected on the availability of ICT tools in the schools.

Table 4.2 Availability of ICT tools in schools

ICT Tool	Yes	%	No	%	Total	%
LCD	25	80.6	6	12.9	31	100
projector	31	100			31	100
Printer	27	87.1	4	72.9	31	100
Modems						

According to table 4.2 basic ICT tools were available in most of the schools however; the number of items per school was low. Most schools had only one of each item indicating that the tools were available but not adequate. The number of the peripheral could easily hamper the integration of ICT in the schools especially LCD projectors in the schools with many streams.

To ascertain further the teachers' preparedness, it was necessary to find out the teachers' personal ownership of the ICT tools. Teachers were asked to indicate whether they owned some ICT tools that could be used in ICT integration. The responses are as summarized in table 4.3.

Table 4.3 Personal ownership of basic ICT Tools by teachers

Item	Yes	%	No	%	Total	%
Desktop Computer	70	33.3	140	67.7	210	100
Laptops/Ipads	41	19.5	169	80.5	210	100
Printer	0	0	210	100	210	100
Scanner	42	20	168	80	210	100
Flash disk	153	72.9	57	27.1	210	100
Modem	110	52.4	100	47.6	210	100

Table 4.3 shows that teachers had in their possession varied ICT tools. The majority of the teachers 72.9% had flash disks. The very important tools the computer themselves whether desk top or lap tops were also possessed by the teachers same as modems mainly for personal internet surfing.

In conclusion, the schools had the capacity to initiate the integration of ICT as the schools as usually the major hindrance in many parts of the world on the implementation of ICT in schools is the electricity power connectivity. However the principals of the schools seem not to be putting much effort to initiate this especially increasing the student-computer ratio.

The Teachers and Students Level of Expertise in ICT Integration in the Teaching and Learning Process

Principals, teachers and students were asked several questions to determine their expertise in the use of ICT. The responses were as follows:

Principals Level of ICT training

Principals were asked to indicate their level of ICT training. From their responses the majority of them 51,6% were proficient (skills acquired through workshops, seminars, apprenticeships), 38.9% had no training and only 9,7% had formal training at diploma certificate level. These observations however

are not good if the principals have to spearhead the integration of ICT in their schools.

On the part of the teachers the findings show that the majority of them 78% had proficiency in the use of computers, 20% had no formal training and only 2% had diploma certificate. It was therefore important to know the institution that trained the principals and teachers or where those who trained did their training. Both principals and teachers were asked to indicate whether they received the training on ICT from the Teacher's Training College (TTC) or University during their preparations as teachers. The majority of the teachers 120 (57.1%) and all the principals indicated that they were not taught computers during their training. These findings are similar to those found by Kiptalam and Rodrigues (2010) who found that a majority of teachers did not receive any prior ICT training during the formative years at the Teacher's Training Colleges or universities before joining the teaching profession. Therefore the teachers received their training on ICT from other institutions. The finding poses a question on the type of content taught in those institutions especially on how to integrate ICT in teaching methodology.

Teachers Level of ICT Competency

To establish the level of teachers' competency or confidence on some skills relating to ICT integration

in teaching, teachers were asked to rate themselves on a likert scale of very good, good, average, and weak on various skills in the applications of ICT. Skills that were tested included teacher’s ability to connect cables to a computer and switch the computer on or off, operating with Word applications which included typing skills and composing document, file management or maintaining digital files so as to organize information to be stored, operating with

internet including skills on attaching files to emails, operating with access and excel application. The other competency examined was on the handling of various troubleshooting complications while using computers and systematic search for source of a problem so that it can be solved. The findings are recorded in table 4.5

Table 4.5 Level of teacher ICT competency

Item	V. Good	%	Good	%	Average	%	Weak	%	Poor	%	Total	%
i. Connecting computer cables to electricity and switching on and off a computer	180	85.7	15	7.1	15	7.1					210	100
ii. Operating with Word processor	82	39.0	101	48.1	14	6.7					210	100
iii. File management e.g. opening, renaming or saving	11	5.2	33	15.7	87	41.4					210	100
iv. Information browsing and downloading	111	52.9	57	27.1	29	13.8	13	6.2			210	100
v. Email communication	82	39	72	34.3	30	14.0	13	6.2	13	6.2	210	100
vi. Networking/communicating with others e.g. twitter/Facebook	56	26.7	72	34.3	29	13.8	27	12.9	26	12.4	210	100
vii. Attaching files to email	97	46.2	44	21.0	28	13.3	15	7.1	26	12.4	210	100
viii. Printing hardcopy document	111	52.9	57	27.1	29	13.8	13	6.2			210	100
ix. Use of presentation application	69	32.9	58	27.6	40	19.0	30	14.3	13	6.2	210	100
x. Technology management eg. Troubleshooting	56	26.7	14	6.7	84	40	43	20.5	13	6.2	210	100
xi. Operating using access and excel	84	40	14	6.7	99	47.1	13	6.2			210	100

The level of teacher’s ICT competency as shown in table 4.5 is low. Most teachers expressed low confidence on file management at 20.2%, troubleshooting 33.4% using excel and access 47.1% while they had high competency or confidence on skills to do with switching ON and OFF of computer at 92.8% and in using word application 87.1% as well as browsing for internet 80%.

The other competency sought was the ability of the teachers to choose appropriate software applications whenever they had a task. The teachers were give three questions to fill in whereby each required them to choose a suitable computer application to perform the tasks given. Table 4.6a shows the outcomes.

Table 4.6a Teachers ability to choose appropriate software for various tasks

Task	Able	%	Not able	%	Total	%
Ability to use graphical presentation	36	17.1	174	82.1	210	100
Ability to type exams	120	57.1	90	42.9	210	100
Ability to analyze results	23	11	187	89.0	210	100

Table 4.6 illustrates that the only greatest ability by teachers was demonstrated in typing exams 120 (57.1%). Thus the teachers were able to choose appropriate soft ware for typing only.

Students Level of ICT Training

Students were asked if they had any training in computers whether from the school or elsewhere, their responses indicated that the majority of them 185 (58.4%) had received ICT training from the class lessons taught by their computers teachers in their schools. To further determine the competency or confidence of the learners on some ICT skills,

students were asked to rate themselves on a likert scale of very good, good, average, weak and poor on their understanding of the various tasks in ICT usage. Skills tested included, skill on connecting cables to a computer and switching the computer on or off, operating with word, skills on internet use including browsing and downloading information, use of spreadsheets and presentation application like PowerPoint demonstration as well as students’ skills in networking or communicating with their colleague on facebook and twitter. The observations are presented in table 4.6b

Table 4.6b Level of student's competency in some ICT tasks relating to learning

Item	V. Good	%	Good	%	Average	%	Weak	%	Poor	%	%	Total
i. Connecting computer cables to electricity and switching on and off a computer	215	67.8	37	11.7	49	15.5	16	5.0			100	317
ii. Operating with Word processor	116	36.6	16	5.0	66	20.8	70	22.1	49	15.5	100	317
iii. Information browsing and downloading	101	31.9	17	5.4	120	37.9	32	10.1	47	14.8	100	317
iv. Email communication	46	14.5	72	22.7	87	27.4	33	10.4	79	24.9	100	317
v. Attaching files to email	37	11.7	81	25.6	55	17.4	48	15.1	96	30.3	100	317
vi. Use of spreadsheet to plot graphs	69	21.8			64	20.2	103	32.5	81	25.6	100	317
vii. Operating using access and excel	85	26.8			48	15.1	87	27.4	97	30.6	100	317
	101	31.9			65	20.5	87	27.4	64	20.2	100	317
	118	37.2	54	17.0	97	30.6	16	5.0	32	10.1	100	317

The level of students' competency as shown in table 4.6 determined in terms of their self evaluation where the responses of either good or very good in a given skill were regarded to indicate high competency or confidence of the student in that skill while those who rated themselves as from average to poor were regarded to have low competence or confidence in the performance of such tasks. A majority of the students demonstrated greater confidence on two operations; connecting computer cables and switching ON and OFF of the computer at 79.5% and networking using facebook and twitter at 54.3%. In all the other skills tested, the students demonstrated low level of confidence or competency. These simple tasks in computer competency and performance are not good enough to give students basis in the integration of ICT in their learning process. This indicates that more need to be done in terms of improving the skills of the students if they have to benefit from the integration process.

In conclusion both teachers and school principals had low competency in the use of computers or ICT. A majority of them did not have formal training in ICT especially during their college training. The students on the other hand seem enthusiastic to learn as exhibited by the high percentage of those who used facebook or twitter. The integration therefore cannot be done since the implementers lacked the pre-requisite competencies and confidence.

Extent Of Teachers' and Students' Integration of ICT In the Teaching and Learning Process

Principals, teachers and students were asked several questions on ways in which ICT was being integrated in the teaching-learning process and their responses were as follows:

Level of ICT usage in the Schools

Principals were asked to generally rate their schools on a likert scale of very high, fair, low and very low on the school's level of ICT usage (e-learning) in teaching-learning process by both teachers and

students as opposed to the traditional methods of talk, chalk, blackboard, text book and hand written notes. Table 4.7 shows the summary of their responses.

Table 4.7 Principal's rating of ICT usage in their schools

Level of ICT usage	Frequency	Percent
Very high	2	6.5
Fair	6	19.4
Low	13	41.9
Very low	10	32.3
Total	31	100

Table 4.7 shows that cumulatively 23 (74.5%) of the principals rated their school's level of ICT usage as between low and very low. In the schools where the principals indicated the integration of ICT in the teaching-learning process, both principals and students were asked to indicate the group of subjects where ICT was being utilized. The responses showed that ICT was generally utilized in all subjects in examination analysis and only in the teaching of sciences and mathematics subjects more frequent than in any other subjects. The finding may suggest a relationship between computer usage and science subjects. Many people do regard ICT learning as a science and difficult to follow the fear that should be removed.

The use of internet in searching for materials for lesson planning and reference by the teachers was another way to determine the ICT integration. The findings showed that 126 (60%) of the teachers did not use internet in preparing for their teaching. The findings may indicate that teachers in Nyeri South District are still using the traditional methods of teaching and have not impressed technology enhanced methods in their mode of teaching. It was important to know from the few who indicated that they used internet in their lesson preparation on how they did it. The observations made are in table 4.8

Table 4.8 Frequency of using ICT by teachers in some basic teaching roles

Task	Always	%	Often	%	Sometimes	%	Never	%	Total	%
i. Information search/ browsing for lesson notes	58	27.6	29	13.8	97	45.2	26	12.4	210	100
ii. Preparing of schemes of work			71	33.8	85	40.5	54	25.7	210	100
iii. Preparation of records of work	29	13.8	29	13.8	55	26.2	97	46.2	210	100
iv. Preparation of lesson plan (lesson planning)	14	6.7	44	21.0	41	19.5	111	52.9	210	100
v. Keeping students records	45	21.4	43	20.5	83	39.5	39	18.6	210	100
vi. Use of digitalized lesson notes	28	13.3	59	28.1	48	20.0	81	38.6	210	100
vii. Preparing class assignment or exercise	14	6.7	44	21.0	56	26.7	96	45.7	210	100
viii. Preparing of typed exams (opener and timely exams)	44	21.0	72	34.3	68	32.4	26	12.4	210	100
ix. Preparation and issuing of handouts/ printouts as lesson notes	15	7.1	85	40.5	82	39.0	28	13.3	210	100
x. Analysis of exams	43	20.5	71	33.8	57	27.1	39	18.6	210	100
	14	6.7	72	34.3	15	7.1	109	51.9	210	100
	14	6.7	44	21.0	70	33.3	82	39.0	210	100

As shown in table 4.8 most of the teachers did not use ICT in the preparation of their professional documents; academic records of work, digitized notes, preparation of class assignments and lesson presentation in class using projectors which all of them had less than 50% response rate. This in itself suggests that integration of ICT in teaching-learning process is not being done in schools. The findings confirm the data from principal's observation that the level of ICT integration in teaching and learning activities was very low.

The students were asked to indicate whether they used computers during the lessons to collaborate the findings in the questionnaire to the teachers and interview with the principals. Their responses confirmed the above findings. The majority of the students 56.8% had no access to computers during the lesson, 30.9% had 1 – 2hours sessions in computers, 11% had 2 – 5 hours and only 1.3% more than 5 hours in a week. These frequencies are too low given that a week has 45 lessons per week of 40 minutes each totaling to 30 hours per week.

The researchers were interested to establish if the students themselves used technology in their studies especially to carry out research in the subjects they were taught in class. The findings show that students sometimes watched VCD or DVD specially recorded on educational issues however many of them only played games. A majority of them did not use computers in their activities for learning purposes. This reveals that there is a very low level of ICT utilization in regard to learning by the students.

In conclusion secondary schools in Nyeri South District are not integrating ICT in the teaching-learning process.

CONCLUSIONS OF THE RESEARCH FINDINGS

- i. Secondary schools had the capacity to initiate the integration of ICT as the schools as usually the major hindrance in many parts of the world on the implementation of ICT in schools is the electricity power connectivity. Schools had teachers who can spear head the training of both teachers and students to impress ICT integration.
- ii. Both teachers and school principals expertise in the integration of ICT in the teaching-learning process is low. The students on the other hand seem enthusiastic to learn as exhibited by the high percentage of those who used facebook or twitter.
- iii. Secondary schools in Nyeri South District are not integrating ICT in the teaching-learning process.

RECOMMENDATIONS

- a. Schools should spearhead the initiatives to integrate ICT in the teaching-learning process by improving on the computer and other peripheral tools.
- b. Schools should improve on the capacity building of the teachers in the integration of ICT in teaching-learning process to move away from the traditional modes of delivery

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APPENDIX II

QUESTIONNAIRE FOR TEACHERS

Section A: demographic information

Have you received any training in computer Yes [] No []

(a) If yes describe your level of computer literacy

	Level of ICT Qualification	Title of training received	Name of institution	duration
1	Proficiency e.g. seminar , apprenticeship, workshop			
2	Certificate e.g. KNEC, ICDL or Equivalent			
3	Diploma			
4	Degree			
5	Any other (specify).....			

- Did your training above include ICT integration in teaching your subject areas or how to incorporate ICT tools in the teaching context?
- Did you receive any ICT training from the TTC or University you studied?
Yes [] No []
(a) If yes did the ICT training cover integration of ICT in teaching specific subject area?
(b) Yes [] No []
- How relevant can you rate the training in terms of equipping you with skills on lesson planning, lesson delivery and preparation using ICT tools?
Very relevant [] Relevant [] Slightly relevant [] Not Relevant

4. How can you rate yourself against the following computer operations

Level of ICT Competency	V. Good	Good	Average	Weak	Poor
Connecting computer cables to electricity and switching ON or OFF a computer					
Operating with Word processor					
File management e.g opening, renaming or saving					
Information browsing and downloading					
Email communication					
Networking/communicating with others e.g twitter and facebook					
Attaching files to email					
Printing hard copy documents from a computer					
Use of presentation software e.g PowerPoint					
Technology management e.g. troubleshooting (fixing basic faults)					
Operation using Access and Excel packages					

Section B: ICT Access, Usage and Attitude Factors

5. Which amongst the following software application can you appropriately choose to perform the task described below? (Ms Access, Ms Excel, Ms Word, Ms PowerPoint)

- i. Classroom graphical presentation in form of slides.....
- ii. Typing your examinations.....
- iii. Analyzing results in your subjects (mean, totals, grades, graphs etc).....

10. Indicate using a tick (✓) if you have the following

- Email address Facebook account
 Twitter handle account Skype account

11. Indicate if you own the following

- a) Laptop, I pad Yes No
- b) Desktop computer Yes No
- c) Printer Yes No
- d) Flash disc Yes No
- e) Scanner Yes No
- f) Modem Yes No

12 Do you use the internet to prepare teaching and learning materials? Yes No

Where do you mainly access the internet?(check using (✓) where appropriate

- At school Via mobile phone Using a Modem At home
 Cyber café Any other form specify.....

13. On average how many hours per week do you use computers/internet on teaching and learning related tasks

14. How often do you use ICT to carry out the following **teaching and learning roles** in your work as a teacher?

	Task	Always (Everyday)	Often (once/twice a week)	Sometimes (once/twice a week)	Never
1	Information search/ browsing for lesson notes				
2	Preparation of schemes of work				
3	Preparation of records of work				
4	Preparation of lesson plans (lesson planning)				
5	Keeping students records				
6	Use of digitized lesson notes				
7	Preparing class assignments or exercises				
8	Preparation of typed exams (opener or termly exams)				
9	Preparation and issuing of handouts/ printouts as lesson notes				
10	Analysis of exams				
11	Lesson presentation using projectors (in classroom)				
12	Lesson presentation using projectors (in computer Laboratory)				

15. What is your **frequency of usage** of the following ICT resources as a teaching and learning tool?

Task	Always (Everyday)	Often (once/twice a week)	Sometimes (once/twice a week)	Never
1 Software use in specific subject area				
2 Use of social network to collaborate with others e.g. colleague teacher (facebook, twitter)				
4 Use of VCD or CD Rom for educational purpose e.g KIE Digital Curriculum				
5 Use of/ allowing student access to TV program for educational purpose				
6 Use of radio for educational purpose e.g. KIE media tapes				
8 Use of email for educational purposes				

16. Describe any importance computers have had in your in class teaching (how you teach, what you teach)

APPENDIX III

QUESTIONNAIRE FOR LEARNERS/ STUDENTS

SECTION A: demographic information

1. Have you received any training on computer use? Yes [] No []
 - a. If yes, who taught you about computers?

SECTION B: ICT Access, usage and attitude factors

2. How well can you do each of these tasks using a computer?

Task	V. Good	Good	Average	Weak	Poor
Connecting computer cables to electricity and switching ON or OFF a computer					
Operating with Word processor					
Information browsing and downloading					
Email communication					
Attach files to e-mail address					
Use spreadsheet to plot gaps					
Operation with Ms Access and Ms Excel					
Use presentation software e.g. PowerPoint					
Networking / communicating with other students or friend e.g. facebook & twitter					

3. Are you able to access computer during classes? Yes [] No []

4. How often do you make use of the following ICT facilities?

5.

	Always	Often	Sometimes	Never
1 Finding information via internet through browsing				
2 Finding information from e-library e.g. Encarta				
3. Communication with other student via email /text messaging				
4 Chatting and networking e.g. facebook and twitter				
5 Downloading music				
6 Playing games				
7 Use education software which are subject specific e.g. physics, geography				
8 Watch VCD or DVD on education issues				
16 Other usage (Specify).....				

6. List the subjects that you are taught in your school using computers and related ICTs e.g. LCD Projectors?

7. Do you look for information on the internet?

Yes [] No []

8. How many hours per week do you use computer/internet in learning

- a) When schools are in session.....
- b) During holidays.....

9. Indicate using a tick (✓) if you have the following:

E-mail address [] Facebook name []
Twitter handle account [] Skype name []

10. How can you generally rate yourself in terms of ICT usage in the learning process against the traditional learning methods (notes and textbooks)?

0 % [] 1-4 [] 5-24 [] 25-49 [] 50-70 [] above 70 []

Tick (✓) as appropriate in the table below

		SA	A	U	D	SD
1.	Computers can help to learn things easily					
2.	Computers are difficult to understand					
3.	Computers and related ICT should be used in learning of all subjects					
4.	All students should have opportunities to learn about computers in school					
5.	Computer usage would promote immorality in schools					
6.	The internet is as resourceful as books can be					
7.	ICTs can make learning enjoyable					
8.	ICTs would assist in understanding of abstract concept e.g. sciences					
9.	Boys are better in computers than girls					

**APPENDIX IV
QUESTIONNAIRE FOR THE PRINCIPAL**

Section a: demographic information

2. Are you trained in ICT? Yes [] No []

(a) If yes, describe your level of computer literacy

Level of ICT Qualification	Title of training received	Name of institution	Duration of training
Proficiency level e.g. workshop, seminar, apprenticeship			
Certificate e.g KNEC, or equivalent			
Diploma			
Degree			
Any Other (specify).....			

Section B: ict Access, Usage and Attitude Factors

3. Is the school connected to electricity? YES [] NO []
4. If YES above, How can you rate power outage (loss of power) in your school against;
 - Always [] Often []
 - Sometimes [] Never []
5. Does your school have back-up power supply e.g a generator Yes [] No []
6. Does the school have a computer lab Yes [] No [] How many computer labs are there? One [] Two [] More than two (indicate
7. How many desktop computers (PCs) are there in the school?
8. How many computers are accessible to: a) Students.....b) Teachers.....
9. Is the school connected to the internet Yes [] No []
 - a. If yes, give the type of connectivity VSAT[] Dial up[] Wireless[]
10. In which ways have you improved access for teachers to ICT tools or encouraged the use of ICT in your school?
11. Indicate whether the following ICT tools are available in your school and give the quantity; Tick if available then indicate quantity

Tool	quantity	Tool	Quantity
Laptop	[] []	LCD projector	[] []
Modems	[] []	Printer (specify)	[] []
12. In which group of subjects are ICT utilized in your school and in which ways? Specify in which area
Maths, languages, Humanities, Applied, Computers studies, Sciences
13. Does your school have a computer teacher? Yes [] No []
If yes how many computer teachers or coordinators are there in your school?
One [] Two [] More than two (indicate)
14. How can you generally rate the level of ICT usage in teaching and learning activities in your school vis-a-vis the traditional methods (talk, chalk, textbooks)
Very High [] Fair [] Low [] Very low []

APPENDIX V

Observation Schedule

	Observation task	What to observe	Remarks
1.	Check if electricity is installed	Switches, wiring	
2.	Check if internet is connected	Routers, internet mast, telephone lines	
3.	Check existence of computer laboratory	Get to physical location	
	a) confirm if building is specially made/ improvised	Inside observation	
	b) confirm if furniture is specially made /improvised	Inside observation Physical count	
	c) get the number of the following:	Physical count Physical count	
	i) Computers in the lab	From one of the computers in the lab	
	ii) LCD projector	switched ON	
	iii) Any other ICT tool		
	d) Confirm the computer specification		
5.	Check if computer lab is used in the learning of other subjects other than computer studies	Computer lab bookings/scheduling	
9.	Check if teachers use ICT in teaching activities and related roles.	Handouts, lesson notes in digital format, schemes of work, typed exams, printed lesson plan	