ANALYSIS OF IMPLEMENTATION STRATEGIES FOR THE ADOPTION OF E-LEARNING IN PUBLIC SECONDARY SCHOOLS: A CASE OF TRANS-NZOIA WEST SUB-COUNTY, KENYA

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ABSTRACT

This study focused on the topic Adoption of e-learning in public secondary schools; an analysis of implementation strategies in Trans-Nzoia West Sub-County, Kenya. The study operated with the following objectives: to establish e-learning implementation strategies and to establish the extent of its implementation. Though the Kenya Institute of Education (KIE) developed e-learning Compact Discs (CDs) for eleven (11) subjects in Form 1 and disseminated them to schools in the year 2005, many schools in the Sub-County do not use them to supplement face to face teaching and the chalkboard prompting this study to analyze strategies and extent and of their implementation. The study was guided by the theory of Perceived Attributes (Rogers, 1995) which postulates the way potential adopters judge an innovation. The study was carried out in Trans-Nzoia West Sub-County of Trans-Nzoia County in Kenya. Descriptive Survey research design was used to produce statistical information about aspects of education that interest policy makers and educators (Borg and Gall, 1989). The study targeted 58 secondary schools, 58 principals, 58 Board of Management (BoM) chairpersons, and Heads of Department (HoDs) of the 58 schools. The sample size comprised of Seventeen (17) schools, Seventeen (17) BoM. members, Seventeen (17) principals and One hundred and four (104) HoDs making a total of 155. Instruments of data collection were questionnaire and interview schedules. Descriptive statistics using percentages and frequencies was used to analyze the collected data. The findings reflect the actual state of the adoption of e-learning in secondary schools. The findings revealed that most of the e-learning implementation strategies were lacking in secondary schools in Trans-Nzoia West Sub-County. There was lack of trained teachers, basic structures and no functional computer labs in the area of ICT. The extent of implementation of e-learning in secondary schools in Trans-Nzoia West Sub-County would not be easily established. This was because no school had indeed started adoption of e-learning.

Key words: *Strategies employed in e- learning Implementation, extent of implementation of e-learning.*

Background to the Study

E-learning or electronic learning is a general term used to refer to computer-enhanced learning (KIE, 2007) and Pollard and Hillage (2001) define e-learning as the delivery and administration of learning opportunities and support via computer, networked and web-based technology to help individual performance and development and has great impact in education. According to Williams, Paprock, and Covington (1999), transitional leadership in distance education requires several factors relating to organizational and administrative elements.

 Recent years have witnessed considerable enthusiasm and contestation regarding the role of ICT in addressing educational challenges in Africa (Keats, 2007). For successful implementation of e-learning in secondary schools there should be an enabling environment characterized by the presence of required facilities and personnel.

Trans-Nzoia West Sub-County has 58 secondary schools but only 6 teach Computer Science as a subject and therefore ICT is not embraced in the majority of the schools. Thus e-learning project is a yet to be implemented in these schools. The Sub-County has benefited from computer for schools Kenya (CFSK) programme which has donated computers to 10 secondary schools with each school getting 10 computers. Most of these computers are poorly stored in the school stores which act as computer laboratories and students hardly access them. Most students are totally illiterate about computer and may not even understand the concept of e-learning.

It is with the above in mind that Kenya Institute of Education (KIE) started a project on digital materials development in line with the national curriculum. The broader goal of the project is to design and develop curriculum support materials in digital format for all the subjects offered in the Kenyan Early Childhood Education, secondary schools, primary schools, non-formal and tertiary institutions. The project started with the secondary schools curriculum because the infrastructure was already established in some of the schools (KIE 2009). The implementation of e-learning in Trans-Nzoia West Sub-County secondary schools is yet to be seen. The question therefore remains that: what are the factors that hinder the adoption of e-learning Trans-Nzoia West Sub-County? According to Government of Kenya (2007), the country is to achieve Vision 2030 anchored on 3 pillars; economic, social and political. The

social pillar includes education and training. This is where e-Learning becomes very crucial in achieving this objective in line with Information Technology which is a key tool for development the world over. This is where the Kenya government's School laptop project becomes very significant.

Statement of the Problem

The Kenya Institute of Education (KIE) initiated the e-content curriculum development team which worked on the digital content and produced draft compact discs (CDs) for eleven (11) subjects in Form 1 and the CDs were to be disseminated to schools. However, many schools in Trans-Nzoia West Sub-County do not use the e-content CDs to supplement face to face teaching and the chalkboard. This prompted the study to be undertaken to establish strategies and extent of implementation of e-learning in secondary schools in the Sub-County. E-learning is not so much about technology as about learning based on technology (Pollard and Hillage 2001).

Objectives

The study operated with the following objectives; 1) to establish e-learning implementation strategies in secondary schools in Trans-Nzoia West Sub-County

and 2) to determine the extent of implementation of e-learning in secondary schools in Trans-Nzoia West Sub-County.

Strategies employed in e- learning Implementation

There is lack of a clear policy framework to guide and regulate various players in the implementation of-learning. It is for this reason that school heads have not been able to effectively play their role in the adoption of e-learning in their schools (Koech Commission, 1999). The government has not put in place clear guidelines on the implementation of e-learning. The e-learning materials are hardly available.

The same observation was made by Mwaniki (2003). They observe that some sponsors neither contribute financially nor morally to the development of sponsored schools.

There is need for training of teachers in colleges and Universities in e-learning to realize implementation of e-learning in schools (Farrell, 2007). UNESCO (2008) observes the outcome of the ICT and e-learning projects depends on those at the heart of education: teachers. The school heads should be front runners in ensuring that their schools embrace the e-learning

programme. The current initiatives towards e-learning in education have been carried out largely by individual institutions with occasional support from the private sector. Of the existing schools, about 2% have a computer laboratory, some desk top computers, and /or limited connectivity to the internet (KESSP 2009).

Kenya Literature Bureau (KLB) and Oxford University Press have over the last few years digitalized some of their titles in anticipation of learning in the digital age.

Implementation of e-learning beginning with primary schools and extension to secondary schools is therefore very crucial in achieving Vision 2030 whose social pillar includes education and training.

The absence or inadequate physical facilities, teaching and learning resources hinder the adoption of e-learning in secondary schools in Kenya. The country is still lagging behind. According to Kinuthia (2009), computers were introduced in Kenya in the 1970s and the internet became available in 1993. By March 2008, only 7.9% of the population had access to the internet. While the number of internet service providers continues to grow, access is still limited, especially in the rural areas.

Kenya has close to 20,000 schools of which only about 15% have electricity and only about 500 schools have computers albeit with limited internet access. In the secondary school sector, out of about 4000 schools, 65% are connected to electricity. Only about 750 schools have an average of 10 computers each although internet connectivity is limited Kinuthia (ibid).

There is also irregular monitoring and evaluation of e-learning programmme (Government of Kenya, 2005, 2004, 2003).

The Jubilee Government initiated a lap top programme for standard one pupils which never picked. According to Kenyatta U.M. et al (2013), the jubilee manifesto of 2013 included the following on ICT; human resource capacity in a digital environment, fiber optic network, free WI-FI, county and constituency ICT incubation hubs facilitating a digital economy through creation of ICT related jobs for the youth.

To achieve the above aims Muthoni (2014) writes, the government budgeted Kshs 53.2 Billion for the deployment of 1.35million laptops to class one pupils over 3 years.

The national laptop project was expected to run from January 2014 by which time 50,000 teachers need to have been trained on

ICT integration in the classroom, besides device assembly, applications uploading, content development and delivering of devices to schools among others. Stakeholder preparedness is at the centre of determining the success or failure of the projects.

Moreover, in the implementations of this mega project, several other aspects such as inclusivity in the delivery of education services were expected to be observed.

According to Muthoni (2014), a three day conference was organized by Elimu Yetu Coalition to: provide forum for the government to share with stakeholders the progress and roll out plan for the laptop project, identify areas of support / partnership as well as the communities and CSO' involvement / role in the delivery of the mega project, ventilate on ways that ICT can provide equal opportunities of learning to especially to the hard to reach areas ,learners with special needs and the marginalized groups and provide opportunity for Kenya to learn from successes and failures of similar initiatives from the sub region (Cases of Ethiopia and Rwanda). Gitura (2013) argues that Rwanda set the pace for the region with the launch in September 2008, of the One Laptop Per Child (OLPC) programme targeting primary school pupils in Standard Four to six. Kenya was following suit with the new Government's plan to issue laptops to school children.

Oduor and Kurian (2014), report that the Sh24.6 billion laptops tender for Standard One pupils was cancelled after an appeals board found the award to an Indian firm questionable.

Extent of Implementation of E- Learning in Secondary Schools

E-learning is a new concept in most developing countries. The use of computer in curriculum delivery in particular promises better and improved methods of content delivery, methodology and pedagogy as well expanding the available teaching and learning resource base. Inadequate funding of e-learning is a factor that inhibits the programme. The resource materials necessary for e-learning are expensive and calls for sustainable funding. The implementation of e-learning is still in its initial stage and is not popular in most schools for lack of funds (KIE 2009).

Inadequate funding is evident from the government's effort to seek for partnership in the provision of e-learning for example

the New Partnerships for Africa's Development (NEPAD) and the Kenyan government through the Ministry of Education (MoE) to introduce e-learning in primary and secondary school where piloting was done in six secondary schools in 2006. NEPAD's funding will assist the government in realizing its dream embedded in Sessional Paper No. 11, of 2005 which points out that the Ministry of Education's policy on ICT is to integrate it into education and training systems in order to prepare the learner and staff of today for the Kenyan economy to enhance the nation's ICT skills (MoE Sessional paper No. 11, 2005).

The New Partnership for Africa's Development (NEPAD) schools were set up as centres of excellence in Information and Communication Technology (ICT) integration, so that other schools could copy their model in e-learning. It was for this reason that they were provided with computers, e-materials, internet appliances and trained personnel. But to gauge their levels of success as e-learning centres there was need to compare them to other schools offering ICT education in Kenya.

It was for the above reason that a study was conducted by Ayere., Odera, & Agak (2010)

to compare the application of the e-learning in NEPAD and non-NEPAD schools in Kenya. Specifically, the study; identified significant differences in levels of integration of ICT in curriculum subjects; surveyed the differences in use of e-materials in education research; examined availability of e-libraries; identified significant differences in academic performance of NEPAD and non-NEPAD schools attributed to e-learning. It was carried out in six of the eight provinces in Kenya, where the NEPAD schools are located. It targeted 1600 form four students from 35 secondary schools involved in ICT education (NEPAD schools included). The sample consisted of three officials from the ministry of education, twelve principals and twelve heads of ICT department (HODs), and 570 of the form four students. The researcher proposes to undertake such a study in Trans-Nzoia West Sub-County.
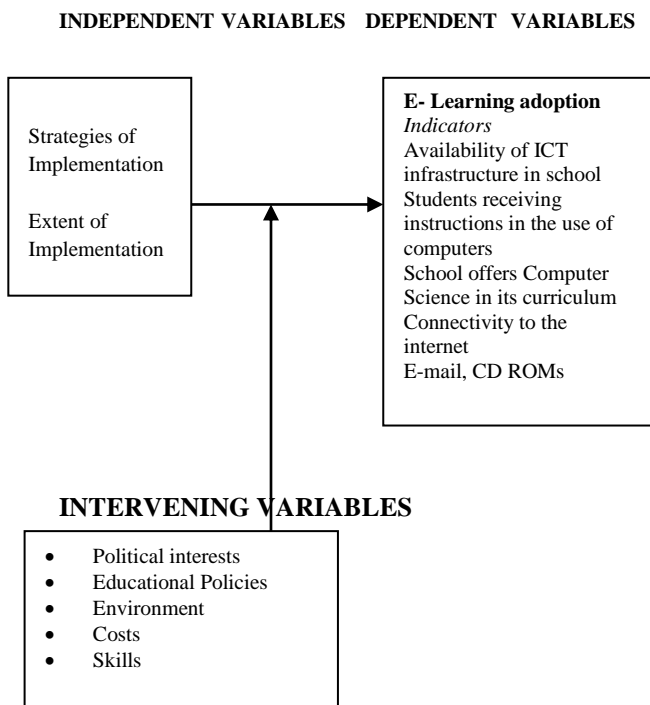
Theoretical Framework

The study was guided by the theory of Perceived Attributes by Rodgers (1995). This theory postulates that "potential adopter's judge an innovation based on their perceptions in regards to five attributes of the innovation thus; trialability, observability, relative advantage,

complexity and compatibility."

Figure 1.1 summarizes the independent, dependent and extraneous variables that will affect the rate and degree of adoption of e-learning in schools.

Figure 1.1: The Conceptual Framework

INDEPENDENT VARIABLES   DEPENDENT VARIABLES

| Strategies of Implementation

Extent of Implementation | E- Learning adoption
Indicators
Availability of ICT infrastructure in school
Students receiving instructions in the use of computers
School offers Computer Science in its curriculum
Connectivity to the internet
E-mail, CD ROMs |

INTERVENING VARIABLES

- Political interests
- Educational Policies
- Environment
- Costs
- Skills

The conceptual framework above shows how the independent variables (strategies of implementation and extent of implementation) will affect the dependent variable adoption of e-learning and the accompanying indicators of adoption as well as the possible influence of intervening variables (political interests, educational policies environment, cost of

implementation and skills) on adoption of e-learning.

Methodology

Research Design

In this study Descriptive Survey research design was used and it produced statistical information about aspects of education that interest policy makers and educators (Borg and Gall, 1989). Gay (1976) further noted that survey research has the advantage of answering questions concerning the current status of the subject of the study as corroborated by the data collected.

The study targeted 58 public registered secondary schools with their 58 principles and 58 Board of Management (BoM) Chairpersons with 348 Heads of Departments (HoDs) giving a target population of 464.

This study worked with 30% of the target population as its sample size.

Kerlinger (1978) recognizes 10-30% of a target population as being an adequate representative sample in a descriptive research.

In this research, multi-stage sampling procedure was used (Cochran, 1977).

The schools were selected using stratified sampling. The schools were first stratified into national, county and Sub-County schools. The Sub-County has one national, eight county and fifty Sub-County secondary schools. After this 1 national, 5 county and 12 Sub-County schools were randomly selected. From the 17 schools, 17 head teachers were sampled purposively as they are automatically privileged to have the necessary information particularly for this research. 102 teachers (HoDs) and 17 BoM chairpersons were randomly selected from the selected schools with each school having 6 teachers' respondents. This means that ultimately each sampled school was represented by 6 teachers (HoDs).

The table below shows the target population and the sample size.

The data for this study was collected using self administered questionnaires and interview schedules. The development of a sound questionnaire requires both skill and time (Gay, 1976).

The interview schedules targeted mainly the principals of schools. They were interviewed about the school establishment, the practices, norms, standards and the culture in the schools. Interview schedule made it possible to obtain data required to meet specific objectives of the study. Heads of schools provided candid information on their role in the adoption of e-learning in public secondary in Trans-Nzoia West Sub-County. Document analysis was used to establish the student enrollment ratio against the number of computers and whether e-learning CDs have been acquired.

A test – retest or co-efficient of stability method was used to estimate the degree to which the same results could be obtained with a repeated measure of accuracy of the same order to determine the reliability of the instrument.

Reliability is a measure of the degree to which a research instrument yields consistent results or data in often repeated trials (Mugenda and Mugenda 1999:95

The data collected was qualitative. The raw data was then categorized through coding and tabulation. Editing was also done to improve the quality of the data coding. Descriptive statistics was used in data analysis, specifically percentages and frequencies because nominal data was collected (Mugenda and Mugenda, 1999).

Results

Respondents' Demographic Information

The study involved a sample size of 138 respondents of whom   104 were teachers (HoDs), 17 BoM members and 17 principals of the sampled schools; all drawn from Trans-Nzoia West Sub-County. The first aspect to be investigated on respondents was their gender (sex). Table 4.1 captures the teachers' and head teachers' gender.

Table 4.1 Teachers (HoDs) Gender

Gender	Frequency	Percent
Male	77	63.6
Female	44	36.4
Total	**121**	**100.0**

Table 4.1 indicates that the majority 77(63.6%) involved in the study were males. The female sex consist of 44(36.4%) of the teacher respondents. This is attributed to the fact that the majority of the teachers in the Trans-Nzoia West Sub-County belong to the male sex. This implies that more males are in the teaching profession in the Sub-County of study compared to females.

The BoM members were also studied on their gender as shown in table 4.2.

Table 4.2: BoM Members' Gender

Gender	Frequency	Percent
Male	13	76.5
Female	4	23.5
Total	**17**	**100.0**

The finding concerning gender of BoM members is similar to that of teachers. Majority of the BoM members 13(76.5%) involved in the study were males while females were represented by 4(23.5%) of the BoM respondents.

Another demographic data aspect studied in the study was school category. Data collected on this aspect are presented in table 4.3.

Table 4.3: School Category

Category	Frequency	Percent
National	18	14.9
County	30	24.8
Sub-County	73	60.3
Total	**121**	**100.0**

Majority of the respondents 73(60.3%) involved in the study were drawn from Sub-County schools. In addition, 30(24.8%) of the respondents involved in the study were drawn from county schools. County schools

were the ones previously referred to as provincial schools. This category of schools is fairly equipped with facilities compared to Sub-County or sub-county schools. The last category of the schools involved in the study was national schools. This category of schools were represented by 18(14.9%) of the teacher respondents involved in the study.

Teachers were also studied on the level of training that they possessed. Their responses are presented in table 4.4.

Table 4.4: Teachers' Formal Training

Formal Training	Frequency	Percent
Certificate	12	9.9
Diploma	23	19.0
Degree	86	71.1
Total	**121**	**100.0**

Table 4.4 indicates that majority of teachers 86(71.1%) respondents involved in the study had degree level as their formal training. This was as attributed to the fact that most of teachers teaching at secondary school level have degree as their highest level of professional training. The second level of formal training of teachers involved in the study was diploma. This level of training

was represented by 23 (19%) of the teachers involved in this study. However, there were 12 (9.9) of teachers with certificate level of formal training. These were teachers teaching Computer Science subject since it is a relatively new area which has not attracted teachers at higher levels. Furthermore, these were not professional teachers and had been hired by the BoM.

Teachers were further investigated on the number of years they had taught in their then stations. Their responses are shown in table 4.5.

Table 4.5: Number of years in current School

Years	Frequency	Percent
0-2years	36	29.8
3-4years	25	20.7
over 5years	60	49.6
Total	**121**	**100.0**

Data presented in table 4.5 shows that majority of teachers 60(49.6%) involved in the study had stayed in their work stations for a period of over five years. This category of teachers had good knowledge about the school operations and gave reliable information about implementation of e-

learning in their schools. Data in table 4.5 also showed that 36(29.8%) of teachers involved in the study had worked in their schools for a period of 0-2 years. In addition, 25(20.7%) of teachers engaged in the study had stayed in their schools for a period of 3-4years.

The last aspect of teachers' demographic data was on whether they had attended computer related in-service course or workshops. Respondents' responses on this aspect are presented in table 4.6.

Table 4.6: Computer Related In-Service Course or Workshops

Response	Frequency	Percentage
No	78	64.5
Yes	43	35.5
Total	**121**	**100.0**

Table 4.6 shows that majority of the teachers 78(64.5%) involved in the study had not attended any in-service course or workshops related to computers. This implied that most teachers were not prepared to implement e-learning programme. However, 43(35.5%) of the teachers involved in the study acknowledged to have attended computer related in-service or workshops.

Respondents who were BoM members were studied on the length of time they had served on the school board. Their responses are captured in table 4.7.

Table 4.7: Length of Time as a BoM Member

Period (in years)	Frequency	Percentage
1-3years	14	82.4
4-7 years	3	17.6
Total	**17**	**100.0**

Table 4.7 shows that majority of the BoM members 14(82.4%) involved in the study had served in their school boards for a period of 1-3years. In addition, 3(17.6%) of the BoM respondents had served on school boards for a period of 4-7years.

Strategies employed in e-learning implementation

The first objective of the study was on strategies employed in e-learning implementation. A number of statements were used in eliciting respondents' responses concerning the strategies put in place.

E-learning cannot be efficiently implemented without a clear policy. Therefore, the study sought to establish whether there was a clear policy to that

effect. The study established that majority 64(52.9%) of the respondents involved in the study disagreed with the statement that clear policy framework guides and regulates implementation of e-learning. an indication that the government in general and the ministry of education, science and technology in particular had not defined clear policy framework on implementation of e-learning. This concurred with Koech Commission, (1999) which observed that there was lack policy framework to guide and regulate various players in the implementation of e-learning. The same observation was made by Mwaniki (2003) that there were no clear policies that guide implementation of e-learning.

Funding is key to implementation of e-learning programme in Trans-Nzoia West Sub-County. Therefore, schools should be adequately funded for implementation of e-learning. The study found out that 43(35.5%) of the respondents strongly disagreed with the statement that their schools had adequate funding for implementation of e-learning.

The study showed that 82(67.7%) of the respondents involved in the study disagreed with the assertion that their schools had adequate funding for implementation of e-learning.

Trained and skilled personnel is key in implementation of e-learning programme in schools. The adequacy of the e-learning staff in the schools was one of the objects of the of the study. It was noted that 47(38.8%) of the respondents disagreed with the statement that schools had adequate staff to implement e-learning.

80(66.1%) of the respondents involved in the study disagreed with the statement that schools had adequate staff to implement e-learning programme. This concurred with Farallel (2007) who noted that personnel for implementation e-learning programmes was inadequate. UNESCO (2008) notes that e-learning should embrace focusing on teachers' computer skills, with the tutors expected to buy personal computers to update their skills.

Resources are quite instrumental in the implementation of any education programme. Therefore, the study investigated availability of adequate physical facilities, teaching and learning resources in e-learning. The study established that 85(70%) of the respondents involved in the study objected the statement

that schools had adequate physical facilities, teaching and learning resources in e-learning. This concurs by Kenya Literature Bureau and Oxford University press that Kenyan curriculum had been lacking digital curriculum support materials for a long time since traditional classroom teaching was the only viable option. The implementation was that even schools with computers had not used them effectively to teach other subjects as tools for Computer Science as a subject. Kinuthia (2009) noted that the observed or inadequate physical facilities, teaching and learning resources hinder adoption of e-learning; that physical facilities like functional computer laboratories lack in most secondary schools in Kenya. Similarly, GoK (2005, 2004 and 2003) noted that teaching and learning materials pose a hindrance to e-learning programme; that there was lack of effective tools to assess learners' needs, irregular monitoring and evaluation of e-learning programme. Inadequate equipment such as scanners, digital cameras and other required software for e-content curtailed implementation of e-learning programme.

The success of any education programme largely depends on the preparation of those involved in its implementation. Therefore, the study sought to establish the teachers'

training in the implementation of e-content. The study found out that 80(66.1%) of the respondents involved in the study disagreed with the assertion that there was sufficient time for training e-content team. This confirms what was observed by Farallel (2007) that the training, especially, for the e-content team was very basic due to time constraint. The study further sought to establish whether teachers were willing to be trained in e-learning. The study found out that 85(70%) of the respondents involved in the study acknowledged the statement that many teachers were willing to be trained in e-learning. This reaffirms the observation by UNESCO (2008) that e-learning now brings into focus teachers' computer skills; that teachers are key players in the education system and need to have knowledge and skills in the utilization of ICT and e-learning a mode of education delivery.

The study also found out that school sponsors are not committed to the support of e-learning programme. This was by 38(31.4%) and 25(20.7%) of the respondents respectively who did not agree and strongly disagreed with the statement that school sponsors fully support the e-learning programme by funding. This concurred the Koech Commission (1999) observed that church sponsors contribute

very little in terms of financial support in sponsored schools.

The study sought to establish the source of the computers owned by schools involved in the study. The study established that 85(70%) of the schools got their computers from "Computer for schools Kenya". The remaining percentage of respondents claimed that they had either acquired their computers through Constituency Development Fund (CDF) or through school funds.

All (100%) of the schools involved in the study had no network in their computers. This made the e-learning more difficult because computers were not networked.

Extent of adoption of e-learning

The second objective of the study was on extent of adoption of e-learning.

The study found out that majority of the respondents 117(84.8%) of the respondents involved in the study disagreed with the statement that their schools had computers for teaching students. In most of the schools from which this category of respondents were drawn; the available computers were hardly used beyond office work. Therefore, the few computers available in the schools

were confined in the administration block and therefore not accessible to learners. This implied that the extent of adoption of e-learning in the studied schools in specific was low and generally in the whole Sub-County.

In relation to the foregoing finding, the study further sought to establish whether the schools had well equipped computer laboratories. It was found out that 125(90.6%) of the respondents disagreed with the claim that their schools had well equipped computer laboratories. This implied that e-learning adoption was far from being realized in most of the schools in Trans-Nzoia West Sub-County. In the absence of well equipped and functional computer laboratories, teachers and learners may not effectively adopt e-learning programme.

It is expected that schools with computers are in a better position to offer Computer Science as a subject up to examination level. The study found out that 128(92.8%) of the respondents involved in the study disagreed with the statement that their schools offered computer science as a subject. This was largely attributed to lack of computers in schools, lack of electricity and unavailability of skilled personnel. Therefore, adoption of

e-learning in these schools remains unachievable until the above cited problems are solved.

The study also showed that 135(97.8%) of the respondents involved in the study noted that their schools did not have internet connectivity. Therefore, adoption of e-learning in such schools remained a challenge since only 5(3.6%) of the schools engaged in the study acknowledged to have websites.

Examinations can also be analyzed through specifically designed software. 97(70.3%) of the respondents disagreed with the assertion that their schools analyzed exams by computers; they hence did it manually.

The computer: student ratio is important in adoption of e-learning when computers are fewer than students then some learners may not have adequate access and practice with computers. The study found out that all 138(100%) respondents involved in the study disagreed with the statement that the computer: student ratio in their schools was 1:2 and below. This was by 99(71.7%) of the respondents disagreeing with the statement and 39(28.3%) strongly disagreeing. Therefore, the schools involved

in the study lacked enough computers and, therefore, adoption of e-learning was low.

The study, further sought to establish whether the e-content CDs prepared by KIE were available in the schools. It was established that all 138(100%) of the respondents involved in the study noted that e-content CDs prepared by KIE were not available in their schools and consequently were not used in teaching various subjects.

Conclusion and recommendations

Most of the e-learning implementation strategies were lacking in secondary schools in Trans-Nzoia West Sub-County. There is lack of trained teachers in the area of ICT. Furthermore, there are no funds to put basic structures in place.

There are no adequate infrastructures in schools for adoption of e-learning. The schools in the Sub-County lack functional computer labs and therefore, adoption of e-learning is challenged.

The extent of implementation of e-learning in secondary schools in Trans-Nzoia West Sub-County would not be easily established.

This was because no school had indeed started adoption of e-learning.

The study makes the following recommendations based on its findings; a) there is need for teachers to be trained in ICT in general and E-learning in specific b) a clear policy on e-learning implementation should be developed, monitored and evaluated , c) a special fund should be set aside for e-learning infrastructure in all the schools d) most administrators need to be sensitized on the difference between a computer lab and an e-learning ICT centre and e) there is need for in depth analysis of viable implementation strategies for the Free Laptop Project for primary schools for its success and boost practical steps towards achievement of vision 2030 in Kenya.

Suggestion for Further Studies

The following areas are suggested for further studies;

1. Assessment of integration of ICTs in secondary schools in Kenya
2. Historical perspective of school categorization and its impact on educational changes.

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